NATIONAL OFFICE OF INDUSTRIAL PROPERTY

A Comprehensive Survey of Existing Technologies in Nigeria's Manufacturing Sector: Agro - Based Sub Sector

DRAFT FINAL REPORT

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NEW DECADE CONSULTANTS

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SUMMARY OF FINDING AND RECOMMENDATION

In accordance with the agreement signed between representativess of NOIP and New Decade Consultants, the latter were assigned the subsector of Agro-allied manufacturing establishments for the purpose of carrying out a comprehensive survey of existing technologies in the manufacturing sector. The following is the summary of our findings and recommendations.

FINDINGS

In all, 259 businesses were surveyed of which 174 usable questionnaires were collected of this. The survey covered desk work and field research using agreed questionnaires. The research had the following broad aims:

(i) To take a stock of existing technologies

(ii) To determine the true cost of technology acquisition.

(iii) To identify areas of need and plenty.

(iv) To make policy recommendations.

It was found out that businesses in agro-allied manufacturing are dominated by internationally traded goods such as, soft drinks bottling, beer brewing, wheat flour mills, animal feeds, sweets, confectionary, sugar, tea, coffee, dairy and similar products. Facilities manufacturing Nigeria's staple foods were few, in comparison.

2. Technologies available were mainly peripheral and of low sophistication. Several elements which have been responsible for major advances in technology have not been acquired by Nigerian manufacturing establishments.

3. Technologies and businesses have been geared more to meeting existing demands based on imported tastes rather than on the staple foods of Nigeria. The problems identified were :-

(a) Unreliable raw material supply

(b) exorbitant and unpredictable local raw material prices - since manufacturers are competing with direct consumer needs.

(c) unacceptabl quality (maize is not yellow$; wheat does not yield the required whiteness; rice is broken in processing etc)

(d) inadequate supply and

(e) non-standardization of many of the products such as tea, groundnuts, maize, yams etc.

4. The pattern of acquisition of technology has been a wasteful duplication of many simple technologies and the total absence of more sophisticated processes and products.

5. Many activities that have been linked with technological development have been completely absent or rather minimal in the subsector under review; such activities as research and development, detail design of products and processes, equipment and machinery fabrication, the design and redesign of products and processes; etc.

6. With regard to the cost of technology, we were able to identify some of the direct costs of technology with particular reference to royalty, patent fees, lumpsum payments, and reimbursables. It is our finding that these do not constitute the most important part of the cost of technology in Nigeria. The majority of the manufacturers started by importing manufacturing artifacts not involving any technology agreements. The main cost of technology therefore is the cost of importing these artifacts. At present no objective basis seems to exist for controlling the price at which these artifacts are acquired. It is necessary to establish machinery price intelligence unit within NOIP to store up for comparison the price quotation of different manufacturers for a given plant with defined performance parameters. This will give ideas on price ceilings for given capacity of a production plant.

It must be emphasized, however, that NOIP has tried to control payments for technology resulting from agreements, and this has no doubt reduced the vast differences observable before NOIP was established. It was usual for the same technology to cost different recipients differently, even from the same transferor.

7. Horizontal trnsfers among entities within the country, especially from old manufacturers to prospective manufacturers does not exist. This is probably due to the uncontrolled nature of the transfer of technology in Nigeria, and the fact that many transferors impose clauses in agreements which prohibit recipients from making secondary transfers. It is certainly unrealistic to expect owners of technology not to take adequate steps to prevent pirating of industrial property. However, to pave the way for interfirm transfers, it is necessary for a body like NOIP to acquire total packages and then distribute different elements to different recipients. This then allows recipients from NOIP to interact and borrow from one another.

8. We examined the effects of technologies in the agro-based industries and other impacts in terms of employment, import dependency, skill acquisition, and foreign exchange utilization. We found out that the potentials for employment have not been utilized to any extent since less than 36,000 people are employed in the establishments covered by completed questionnaires. This represent over 60 percent of total employment in the

organised sector of agro-allied industries employing more than 10 people. The technical skills available in the subsector are biased towards operation and maintenance. Little R & D is carried out in manufacturing establishments. Most R & D is done by Government-owned laboratories and research institutions.

9. The activities of research establishments have not had a major impact on the development of technology in the agro-allied sector. The agro-based research instituties have invented new products such as soy-ogi, vita-fufu, bottled palm wine, instant pounded yam, and mechanized gari. There has also been some advances in the area of product storage. However, there is a very slow rate of diffusion from invention to commercially viable innovations. It is necessary to provide specific incentives for the promotion of diffusion. This is proposed in our recommendations.

SUMMARY OF RECOMMENDATION

Our recommendations are summarized as follows:

1. We identify the major constraint to technological development in this subsector as the import dependency of production. It is our suggestion that unless the materials that are the staple food of Nigerians are produced in substancial quantities so that the basic food requirements of the country are met and surpluses are made available for processing, technological progress is doomed. This is not a new diagnoses but it has been ignored to the detriment of the country. Pious Injuctions that Nigerian industrialists should use local raw materials will have no effect unless these raw materials are fully available at competitive prices.

2. We recommend that NOIP should spend more of their time developing total technology packages so that all of the elements of technology required for innovation can be acquired and made available to all prospective investors. This will minimize the present proliferation of agreements on similar technologies.

3. Research and development should be should be encouraged to deal with the current problem of excessive duplication of simple technologies in this country. We recommend the establishment of funds such as:

   (i) soft drinks bottling funds for the development of local concentrates

   (ii) A Beer brewery fund for the development of malt from local grains

   (iii) A Baking flour fund for the development of substitutes to wheat flour for the baking of biscuits, breads, cakes

   (iv) (iv) Machinery adptation fund for the development of technical solutions using standard machinery for use in the agro-allied subsector.

4. To obtain the finance for these various funds we recommended the following arrangements:

   (a) All manufacturers in the industries affected should be made to pay 10 percent of their after tax profits to the recommended fund; alternatively, additional import duty be imposed on the imports and the proceeds passed on to the fund.

(b) the Federal Ministry responsible for science and technology should provide matching funds equal to what all manufacturers have contributed to the fund.

(c) Utilization of the fund resources should be tied to applied research programmes of individual manufacturers or independent organisations seeking solutions to specific problems defined by the fund; existing R & D institutes could be funded to deal with these problems.

(d) Fund membership should be drawn from the individual firms (on a rotational basis) and from representatives of the ministry in charge of science and technology.

5. We recommend that R & D should be developed and encouraged in the subsector through:

(i) Providing tax shelters for investments in technical solutions to important technical problems within industry.

(ii) Provision of special incentives to research institutes for the commercialization of their inventions.

(iii) A detail study of the various government research institutes for the purpose of securing a greater diffusion of their advances.

6. To control the price of imported manufacturing artifacts, and increase horizontal transfers, NOIP should consider developing an information network to function as a data - intelligence gathering agency. It will providelocal buyers of foreign technology, raw materials, technical services and other artifacts with information regarding available capacities, comparable efficiency levels, technical capabilities, comparative prices in relation to performance parameters, location etc. The network should salso serve as a brokage institution that indicates:

(a) opportunities for interfirm co-operation;

(b) producer problems and where technical expertise might be found for their solution;

(c) quantitative data on the socio-economic impact of different technical options for producing different products;

(d) the location of new products and processes within Nigeria.

NEW DECADE CONSULTANTS

A COMPREHENSIVE SURVEY OF ALL EXISTING TECHNOLOGIES IN NIGERIAN MANUFACTURING SECTOR:-

AGRO-BASED SUBSECTOR

DRAFT FINAL REPORT

CHAPTER ONE

AIMS AND OBJECTIVES OF THE SURVEY

(i) BACKGROUND INFORMATION:

Representatives of the National Office of Industrial property Western Avenue, Iponri Lagos and those of New Decade Consultants signed an agreement on October 13th, 1983 under which New Decade Consultants were assigned the above Survey.

In fulfilment of Article 5.02 (ii) of the agreement a progress report was submitted to the clients on November 9th, 1983. On 19th January 1984 our Interim Report was submitted to the client in compliance with the provisions of Article 2.01 (i) of the agreement.

The survey went through several stages of joint reviews and modifications at bi-weekly meetings of consultants and the client. At one of such meetings held on September 28th, it was finally agreed that the draft final report should be submitted on October 25th 1984. This Draft Final Report is in compliance with that agreement.

(ii) THE NOIP INITIATIVE

The National Office of Industrial Property took the initiative to commission this study because data did not exist for the formulation of policies and developing strategies to carry out those functions for which the office was set up. The office had to start by taking stock of technologies available in order to determine areas of self-sufficiency as well as dire need.

International agencies such as the United Nations of Industrial Development Organisation UNIDO and the United Nations Conference on Trade and Development (UNCTAD) have done extensive work on technology and the transfer of technology. However the work done by these organisations does not provide the kind of detailed and country-specific information that NOIP required for its work.

In fact, it is felt that NOIP initiative may generated valuable data for comperative work by these international organisation's.

(iii) THE AIMS AND OBJECTIVES OF THE SURVEY.

In conjuction with the clients the aims and objectives of the survey were defined in four broad categories; as follows:

(a) to identify the stock of existing technologies, their origin, levels of sophistication, level of assimilation, areas where relative self-sufficiency has been achieved and others where dire need or scarcity exists;

(b) to determine the modes of transfer, cost and other conditions for the acquisition of imported technology;

(c) to evaluate the effects of technology transfer in some crucial areas of Nigerian economic development;

(d) to formulate, recommend with regard to policies, institutional mechanisms and infrastructure necessary for fostering technological development in the Nigerian manufacturing industry, and effective control of the importation of technology from abroad.

The four broad objectives are further explained in detailed as hereunder.

(a) STOCK TAKING OF EXISTING TECHNOLOGIES

The stock taking is to determined the contents of existing manufacturing technologies in terms of:

1. Factory design
2. items of machinery and equipment
3. raw material and other input usage
4. the production processes in the various factories.

5. plant construction, machinery erection, installation and commissioning;
6. the particular technical skills involved in
   - design
   - fabrication
   - operation
   - maintenance
7. the depth of managerial skills available in
   - administration and organisation
   - production operations
   - marketing and procurement of inputs
   - financial management
8. the extent of research and development undertaken in the sector
9. the availability of detail manuals for operation, maintenance, product design and redesign.
10. the pattern of acquisition of technology in the the sector in terms of
    - a comparison of content within the same industry
    - a comparison of the mechanisms of transfer e.g licensing agreements, joint ventures, direct purchase of machinery and equipment.

b. DETERMINATION OF THE TRUE COST OF TECHNOLOGY

It is the intention of the client that the true cost of the technologies available be determined with respect to

1. direct periodical payments as royalties and patent licence fees
2. direct periodical of technical and management fees

3. re-imbursable payments made in respect of expenses incurred on behalf of recipient by the owner of technology;
4. all quantifiable indirect costs through transfer pricing of inputs purchased from technology transferors such as
   - intermediate inputs (such as concentrates, chemicals, special formulae etc)
   - spare parts and supplies
   - other raw materials
   - components, machinery, equipment, jigs and fixtures etc.

C. THE IDENTIFICATION OF NEED AND PLENTY

1. In determining the areas of need, it is intended that an assessment be made of the extent of self-reliance in terms of the technologies;
   1. a measure of Nigerian participation in factory design, machinery fabrication erection and installation of machinery.
   2. the extent of reliance on imported raw materials
   3. the extent of Nigerian indigenous participation in product design, the manufacturing process, maintenance, research and development.
   4. how much R & D is done in Nigeria on the various products.

II. An assessment of self reliance with respect to the output of the variuos establishments within each

industry in relation to the total Nigerian demand. This is to reveal those areas where further import of technology is required and should be encouraged and those areas where prospective investors can be directed to seek technology within Nigeria.

III. An assessment of the impact of the various technologies on the economy, as determined by

(1) the share of Nigerian output of the goods and services manufactured

(2) the price of the local product in comparison to CIF prices of similar imports.

(3) local value added

(4) employment generation

(5) savings in foreign exchanged due to local manufacture.

IV. An assessment of the extent of duplication within each industry.

V. THE DEVELOPMENT OF POLICY

The objective is to use the results of the research to evolve clear- cut policies on a number of issues for which NOIP was set up. Such issues as:-

1. The institutional framework and mechanisms for fostering technological development in Nigerian Manufacturing industry;
2. the various enabling infrastrural facilities geared specifically to rapid industrialization;
3. policies relating to the acquisition of foreign technology with particular reference to:

- appropriate level, type, and mode of payment ;
- choice of technology
- incentives to encourage the acquisition of some technologies in perference to others;
- contractual arrangements between foreign owners and local users of technology;

4. The establishment of standards of payments and remunerations for borrowed technology.

The benefits expected to be derive from acheiving those aims and objectives are many. These will include:

(a) a better appreciation on the part of Nigerian authorities of the problems and prospects of rapid technological transformation in the country;

(b) a more correct assessment of what exists in Nigeria in terms of know-how relating to manufacturing;

(c) sizeable reduction in the total payments to owners of technology in the form of royalities, rents, trademark fees, technical fees, management fees, transfer pricing and other forms of technology payments;

(d) a harmonization of policy with respect to the acquisition of technology in Nigeria;

(e) substantial savings in foreign exchange due to a reduction in cost of technology, and the rationalization of technology acquisition in the various subsectors of manufacturing; and

(f) the better prospect that the pace of technological transformation of the Nigerian economy can be increased to the benefit of the country.

REPORT FORMAT

In accordance with the various discussions held on this survey and "the proposed unified outline of the final sectoral report" as agreed, this report is presented as follows:-

Chapter 1. Background Introduction, Aims and objectives of Survey

2. Research Methodology

3. The Stock of Existing Technologies in Nigeria: Analysis at the Industry and Product levels.

4. Scope, Cost and effects of Technology Transfer in Nigeria.

5. Institutional Infrastructure and Policies for Strengthering Technological capabilities in Nigeria

6. Conclusions and Policy Recommendations.

It was felt that a descriptive approach will reveal the state of technological development in Nigeria, much more than a quantitative approach. In order to reflect this fact, a descriptive annexure to chapter III been written. It is presented in a seperate volume in order to minimize the size of of the main report.

CHAPTER TWO

RESEARCH METHODOLOGY

The methodology of the research was designed to include:

(i) Desk Survey

(ii) Choice of sample

(iii) Field Survey using

- Questionnaires and
- Personal interviews

(iv) Data analysis

(v) Presentation of results.

(i) THE DESK SURVEY

THe desk survey is perhaps the most critical ingredient in the actual mapping of the area of research. It is relied on for the identification of the total field of research, the assessment of what is known or exist in published and unpublished form on the subject of research. This enables us to benefit from existing work and to concentrate on acquiring novel items of information. More importantly it is intended to obviate waste of resources in the collection of inofrmation that already exists or has been collected in other forums

Our desk survey covered the following institutions:

(i) The Registrar of companies' office of the Federal Ministry of Commerce.

(ii) The various state Ministries of Trade and Industry,

(iii) The Nigerian Stock Exchange in Lagos.

(iv) The research Department of the Central Bank of Nigeria.

(v) The Federal Ministry Industries in Lagos

(vi) The Manufacturers Association

(vii) The Federal Office of Statistics

(viii) The National Office of Industrial Property (the clients).

A detail list of purported manufacturers in the Agro-allied subsector was obtained from the office of the Registrar of Companies. However, it was found out that most of the companies listed were not in operation and had not filed the legally required annual reports since inception. Of the 1,912 companies identified, only 317 had any form of records in that office beyond the initial forms filed for incorporation.

We covered the 19 states' Ministries of Trade and Industries This has enabled us to obtain their own directory of manufacturers in the agro-allied sub-sector.

At the Nigerian Stock Exchange we obtained all available published information on the companies listed at the exchange. This included their annual accounts and prospectuses covering special offers for sale. This information enabled us to

obtain actual figures on all listed companies without the necessity of their providing that item of information in the questionnaires administered.

The Manufacturers Association gave a list of members in the Agro-based subsector. However much of the information regarding their activities was available only for very few of the members.

The most fruitful aspect of our desk study was carried out in the NOIP itself where we had the priviledge of examining the files of all of the manufacturers in the subsector who ever applied for approval of technical and management agreements. In all we examined 38 such agreements, we also found fairly up-to-date information on such aspect of the companies activities as

- plant locations
- plant capacity
  - rated
  - actual
  - projected
- Employment
- Expenditure on R & D
- Various measures of performance
- Cost of technology
- Sales (overtime)
- Product mix
- Raw material usage
- Pricing

This was possible because most of the companies also completed the NOIP form and submitted their annual reports and some accounting information.

Very comprehensive information was obtained in respect of the various breweries possibly because they had agreements awaiting NOIP approval. This made field survey of the companies which had files at NOIP, easy, only information not already made available on files was sought at the interview stage.

(ii) THE RESEARCH SAMPLE

The desk survey helped to reduce the total research field. Before desk survey was done we were under the impression that therewere over 5000 manufacturing establishments engaged in the agro-allied sub-sector of manufacturing . The largest component of these were:

- Over 2,300 small bakeries employing less than 10 people on a regular basis.
- Cottage industry manufacturers of various food stuffs such as gari (about 581) yam flour (206) rice mills (67) cassava flour
- grain millers who mill for house wives bringing their prepared grain for milling;
- carpenter and tailor workshops also employing less than 10 people but listed in various state directories as carrying on a manufacturing business;

- cottage hand looms where the size of employment did not exceed 10
- small handicraft establishments making-baskets, pottery, carvings and other traditional goods
- farm-based feedmillers, with seasonal and small-scale operations often undertaken to meet the requirements of the farm.

Apart from these small-scale manufacturing establishments, we also discovered that a large number of establishments listed in industrial directories either at state level or at the Federal level were no longer in operation. The great depression in the economy led to the closure of several factories which were listed as operational.

Initially, the client required 100% coverage of the manufacturing establishments in the subsector. That would have meant covering a total of 687 operation establishments which meet our criteria for inclusion. Several problems made this goal unrealistic -

(a) It was assumed that each functioning entity could respond to the questionnaire on its own without recourse to any other entity; In fact it was clear as the field survey progressed, that some parent entities had many subsidiary plants or units in different locations, whose operations were centrally controlled. Examples were in the beer, soft drinks, oil seed crushing and textile establishments. The implication was that the existence of 15 Nigerian Bottling Company factories did not require surveying

all the plants for our purpose. What is more important, NBC plants will not complete any questionnaire without reference to their head office at Iddo.

(b) obtaining responses to the survey questionnaires became so difficult that the number of visits before collecting a questionnaire escalted from 2 in November 1983 to six by July 1984; there was so much apathy on the part of the various manufacturing establishments that it could take a lifetime of visits if 100% coverage was aimed for.

These difficulties led to a decision that consultants should at least try to cover 70% of the manufacturing value added and sample of companies employing 50 employees and above. We have covered more than 80% of establishments employing 50 people or more and the value added of our sample is estimated to be more than 75% in case of the industries covered.

The sample is not a random sample of all manufacturing establishments in the agro-allied sector. Rather it is a selected sample. All establishments employing less than 10 people on a regular basis are excluded. An attempt is also made to cover the industry leaders in each industry, in order to ensure that the bulk of value added is included in the survey sample. (Refer to Table 2.1).

(iii) THE FIELD SURVEY

In the field survey, two broad tools were used-the survey questionnaire and personnal interviews of top executives of the firms surveyed.

The field work on this research is not orthodox. Normally a researcher usually maps out his population or sample and then sends out his questionnaire. He can then follow up with field visits to deal with aspects not covered by the questionnaire or to encourage response where response is not forthcoming.

In the case of this research, the questionnaires are administered during the actual visits by the research personnel, for several reasons:

(a) the NOIP wanted 100% coverage;

(b) many purported manufacturers listed in directories and the files of the Registrar of companies were either not in production or had closed down at the time of the survey;

(c) many unlisted manufacturers were discovered during the field surveys;

(d) in view of the sheer bulk of the questionnaire, it was clear to us that unless it was administered in an interview setting, very little response would be forthcoming.

(e) A mailed questionnaire ran the risk of being ignored in an atmosphere of general austerity and difficulty of keeping factories operating with little or no raw materials.

This strategy has added enormously to the cost of the research because at least two visits and in many cases four visits are required in order to obtain response to the questionnaire.

THE QUESTIONNAIRE

The questionnaire is divided into four broad headings;

A. IVENTIFICATION

B. TECHNOLOGY USAGE

C. IMPACT OF TECHNOLOGY

D. GENERAL INFORMATION

A. IDENTIFICATION

The first five questions are designed to identify the respondent firm, in terms of name, postal address, ownership, products and plant locations. The question on plant locations helps to delimit the survey because only the controlling organ was surveyed.

For example, Nigerian Bottling Company had 15 operating plants at the time of our survey; Nigerian Breweries had 4; Nigerian Tobacco company had 2. In each case the parent establishment was the subject of survey. This was also true of Livestock feeds Ltd which had 8 plants and several dependent outfits.

B. TECHNOLOGY USAGE

This section forms the main body of the research. Question 6 deals with source, 7 seeks to determine what was actually acquired by the respondent firm the mechanism of transfer and the intensity. Question 8 examines the agreements entered into and the terms. Question 9 through 11 examine the selling points of the technology and the recipients absorptive capacity.

C. IMPACT OF TECHNOLOGY

Question 12 examines costs to recipients and some of the costs to the economy. In Question 13 an attempt is made to classify the technology in accordance with knowledge intensity. We explain this further under methods of analysis. This is meant to give some indication of the complexity of the technology under discussion.

Question 14 attempts to measure technology absorption i.e the extent to which a recipient is able to innovate on the basis of the initial transfer. Question 15 is meant as an incentive to the respondents to give them some assurance that they stand to gain by the research. It measures some impact of the austerity and solicits suggestions to solve raw material problems. Question 16 is a complement of Question 15.

D. GENERAL INFORMATION

The four questions under this sub-heading complement the classification questions and allow us to make some assessment of the validity of the category into which each establishment is placed.

SUB-SECTOR INDUSTRIES

In all we have four major sub-sector industries covered in the sub-sector of Agro-based. These are:

		ISIC
(i)	Food, beverages and tobacco	311
(ii)	Textiles and related	321
(iii)	Wood products	331
(iv)	Paper and Paper products	341

These are further broken down into the four-digit ISIC codes as outlined in our table 2.2. The geographical spread of the survey is summarized in our Table 2.3 below also. The three regional categories shown are as agreed earlier on by the client and the consultants.

THE INTERPERSONAL INTERVIEWS

Interpersonal Interviews were held with selected respondents in the various industries covered. The aim of the interviews was to develop qualitative material that will go behind the quantitative measures of the questionnaires, to capture the real issues of:

- Process technology
- product technology
- problems; and
- the innovative attempts in the industry.

The qualitative material from the interviews and our desk surveys have been brought together for each industry under review and presented as an Annexure to chapter 3. It constitutes volume II of this report.

(iv) DATA ANALYSIS

Analysis of data can be meaningful only in relation to the objectives of the survey, and the kind of data collected. If the unified questionnaire introduced at the tail end of the research had been used by all consultants concerned, it would have been possible to obtain uniformity in analysis. Unfortunately each group had to rely on its own questionnaire.

Certain items of information are common in all of the questionnaires. This relates to the factual items not calling for the opinions of the respondent. To secure some

uniformity NOIP and the consultants agreed to present these facts in certain specific tables which were taken as the bearest minimum required of all consultants. These tables are:

(i) Questionnaire coverage and Response Rate

(ii) Size of firms included in the final sample.

(iii) Sample of firms by the level of Foreign Holdings.

(iv) Sample of Firms by Nature of Business

(v) Level of Sophistication of existing Technologies in Sample Firms.

(vi) Source of Technological Components.

(vii) Contractual Arrangements for the Transfer of Technology, by Industry group and as % of total.

(viii) Nature of Agreements for the Tranfer of Technology.

(ix) Total Payments for Technology During Last 5 years by Nature of Payment.

(x) Level of Royalty Rates

(xi) Dependency on Imports of Raw Materials . (Value)

(xii) Dependence on Foreign Personnel (1981 - 83) by Category of Personnel

(xiii) (a) Training Programme of firms

(b) Quality Control Activity of Firms

(c) Research and Development Activity of Firms.

These tables were required as the bearest minimum to be provided by each consulting group. The groups were also required to provide certain annexures to their reports. Theses were:

(i) List of Companies contacted

(ii) List of Companies included in the final sample.

(iii) The unified questionnaire introduced by the client.

CHARACTERISTIC OF COMPANIES INCLUDED IN SAMPLE

A total of 259 entities were covered in this draft final report. Of nthese 174 questionnaires were fully completed. We have partial information on 16 other entit ies, and intend to upgrade the information by further re-visits. For all analysis in this report 169 completed questionnaires are used. This represents 65.3% of toal survey sample.

The largest number comes from the biggest industry category of food, beverages and tobacco, with a total of 135 questionnaires, The next largest group is that on textiles, followed by the wooden furniture and fixtures. Further details are given in Table 2.1, Summary of Sample.

In term of ownership, Table 2.4 gives the ownership patterns while Table 2.5 gives a measure of respondent firms by size. It is obvious from Table 2.4 that foreign ownership is very low in the agro-based subsector of Nigeria's manufacturing.

Table 2.1 SUMMARY OF SAMPLE

Industrial Subsector		No. of Questionnaire Received	No. of Companies Surveyed	No. of Questionnaires Used in Analysis
1. Food Manufacturing	ISIC Code			
	3111	2	7	2
	3112	7	12	7
	3113	2	3	2
	3114	2	2	1
	3115	15	25	15
	3116	15	14	15
	3117	16	27	14
	3118	4	7	4
	3119	20	20	20
	3122	10	21	10
2. Beverage	3131	2	2	2
	3133	6	15	6
	3134	19	21	18

Table 2.1 Contd.

Industrial Subsector		No. Of Questionnaire Received	No. of Companies Surveyed	No. of Questionnaires Used in Analysis
Tobacco	ISIC Code 3140	3	5	1
Textile	3211	10	17	9
	3212	7	13	7
	3214	1	2	1
Leather & Products of Leather	3231	1	3	1
	3240	5	5	4
Furniture & Fixtures	3320	15	16	14
Paper & Paper Products	3411	8	11	8
Rubber Products	3336	7	8	5
	TOTAL	177	257	166

Source: New Decade Consultants 1984

Table 4.2

ISIC CLASSIFICATION FOR RETURNED QUESTIONNAIRES - AGRO - ALLIED SUB SECTOR

Slaughtering Preparing & Preserving Meat

ISIC CODE	FIRMS
3111	Bauchi meat factory Bauchi
	Niger Pork Products Co. Ltd Nnewi
3112	Madara Dairy Co. Ltd Jos
	Nigerian Associated Best Food Jos
	Nigeria Dairies Co. Ltd Sokoto
	Foremost Dairies Nig Ltd Mushin
	West Africa Milk Co. Nig Ikeja
	Adamu Farms Ltd Auchi
	Foods Div. of U.A.C. Lagos.
3113	Vegetable & Fruit Processing Bauchi.
	Lafia Canning Factory Ibadan

Canning, Preserving & Processing of Fish

ICSI Code 3114	Rock Water Fish Farms Ltd Jos,
	Niger Pork pack Product Ltd Nnewi

Manufacturing of Veg. & Animal Oils & Fats Code

ISIC Code 3115

Gombe Oil Seed Processors Ltd Bauchi
Kano State Oil & Allied Products Kano
Road & Fadoul Ltd Kano
The Kano Oil Mills Kano
Nigerian Oil Mills Ltd Kano
Pioneer Oil Mills Ltd
Pioneer Palm Oil Nnewi
B. N. Okongwu & Sons Ltd Umuahia
Oddy Contracts Nig Ltd Ibadan.
Vegetable Oil (Nig) Ltd Lagos
Oil Palm Co. Ltd Auchi
Oil Palm Co Ltd Sapele
Davog Oil Mills Ltd Aiure
Nifor Oil Mills Benin-City
Nimad Co Ltd, Kano

Gran Mill Products

ISIC Code 3116

Nigerian Grain Product Co Ltd Kaduna
Flour Mills Nig Ltd Lagos
Nig. Eagle Flour Mills Ltd Ibadan
Northern Nigeria Flour Mills Kano
Ideal Flour Mills Ltd Kaduna
Niger Mills Co Ltd Calabar
D. O. Akabike Garri & Corn Mill Ltd Njikoka
P. N. Imoke & Bros Rice Milling Otuocha
Uzoma Rice Mill Abakilaki
Grain Processing Co Ltd Azare
Adarice Product Project Ltd Uzo Anani

ISIC Code 3116	Seed Processing Plant, Gombe
	Seed Processing Plant Eastern Zone Projects Lisabi Mills Nig Ltd
	Ikwo United FMCS Ltd Abakaliki

Manuf. of Bakery Products

ISIC Code 3117	Arowosaye Bakeries Jos
	Five Star Bakery Kano
	Gusau Bakery Ltd Gusau
	Congo Bakery Ltd Benin
	Northern Bakeries Nig Ltd Kaduna
	Kazi Ejidike & Sons Bakery Onitsha
	Toni Toni Special Bread Benin
	Uncle Bens Bakery Benin
	Maho Works Ltd (Bakery Div) Benin
	Midwest Rational Bakery Benin
	Kris & Sons Investment Ltd Calabar
	Hi-quality Bakery Ltd Calabar
	Alasinrin Bakery Ltd Jos
	Bagauda Biscuits Co. Ltd Kano
	Nig Biscuit Manf. Ltd Ibadan
	Nasco Foods (Nig) Ltd Jos

Sugar Factories & Refineries

ISIC Code 3118

Tate & Lyle Nig Ltd Ilorin

Kano Sugar Industry Ltd Kano

Swiff bird Sugar Co Ltd Ibadan

Nigerian Sugar Co Ltd Bacita

Manf. of Cocoa, Chocolate & Sugar Conf.

ISIC Code 3119

Kano Conf. Ltd Kano

Moon Confectionery Ltd Kano

Gusau Sweets Factory Gusau

Star Sweets Company Ltd Kano

The Candy Co Nig. Ltd Kano

Halawa Conf. Nig Ltd Kano

Yassin Conf. Co. Ltd Kano

Champion Conf. Co Ltd Jos.

Quality Foods Ibadan

Nigeria Biscuits Manufacturing Co Ltd Ibadan

Chido Foods Ikeja

A. C. Christies (Nig) Ltd Apapa

Lypton Of Nig Ltd Apapa

Cocoa Industry Ltd Ikeja

Ovaltine (W.A) Ltd Ikeja

Tropic Foods Ltd Benin

Cocoa Products Industry Ede

Ile-Oliyi Cocoa Product Ondo State

Niger Biscuit Co. Ltd Lagos

Animal Feeds

ISIC Code 3122	Okor Nwokoro Poultry Farm Abakaliki
	Livestock Feeds Ltd Ikeja
	Bendel Food Production Board
	Bendel Foods Sapele
	Bendel Food Agbede
	Peco Feeds Ltd Enugu
	Eto Agric Ltd Okoro
	Tiffany Farms Auchi
	Oniado Enoms Farms
	Fadile Feeds Kabba

Distillery

ISIC Code 3131	West African Distillers Ltd Ikeja
	Amalgamated Distilleries Nig Ltd P/Harcourt

Beer (malt Liquor)

ISIC 3133	Guinness Nig Ltd Ijeka
	Nigerian Breweries Ltd
	Sparkling Brewery Ltd Ubelli
	Sperbru Agbara - Oto
	I B B I Kaduna
	Kwara Breweries Ltd Ijagbo

Soft Drinks	Firm
ISIC Code 3134	Rexonoh Brewery Ltd Enugu
	Nigerian Bottling Co. Ltd Iddo
	Drinco Ind. Ltd Kaduna
	Okada Bottling Plant Kano
	Danta Cola Co Ltd Kano
	Garba Bottling Co Ltd Kano
	Okin Bottling Co Ltd Kaduna
	New Food & Drinks Co Ltd
	Arewa Bottlers
	Bauchi Bottling Co Ltd
	Hill top Bottling Co Ltd Jos
	Zaki Bottling Co Nig Ltd Sokoto
	Bolori Bottling Co Ltd Bauchi
	Nigerian Soft Drinks Co Ltd
	Lagelu Bottling Co Ltd Ibadan
	C H I Ltd Ikeja
	Union Beverages Ltd Ibadan
	Okada dry Nig Ltd Benin
	Union Beverages Ltd Lagos
Tobacco Manufacture	
ISIC Code 3140	Varsity Ltd Onitsha
	Nig. Tobacco Company Zaria
Textile	Phillip Morris Ltd Ilorin
Spinning, weaving & Finishing ISIC Code 3211	Odu'a Textiles Ltd Ado Ekiti
	Nigerian Textile Mills Ikeja
	Enpee Ind. (Nig) Ltd Lagos
	Spintex Mills (Nig) Ltd

	Atlantic Textile Manufacture Lagos
	Kay Ind. (Nig) Ltd Ikeja
	United Nigerian Textile Kaduna
	Kano Textile Printers Kano
	Kaduna Textile Ltd Kaduna.
	Nigeria Cotton Board , Kaduna.

Made Up Textiles

ISIC Code 3212	Universal Textile Ind. Ltd , Kano
	Offiasco Ltd Aba
	Singlet Ind. Aba
	Agwu & Brothers Aba
	Niger Garments Manufacturing Aba
	Adazi Enu Ind. Awka
	Chinedu Textile Ind. Abagana

Carpets & Rugs

ISIC Code 3214	Carpet Royal (Nig) Ltd Ibadan.

Cordage & Ropes

ISIC Code 3215

Tanneries

ISIC Code 3231	Umuoji Ind. Co Ltd Onitsha

Leather Footwear	
ISIC Code 3240	Nwoba & Co Shoe Industry Onitsha
	Ezechukwu Shoe Manufacture Ltd Onitsha
	Idemili Ind. Ltd Onitsha
	Ajikeola Ent. Ltd Ogbomosho
	Standard Shoe Co Ltd Owerri
Manufacturing of Furniture & Fixtures	
ISIC Code 3320	Akinbolaji & Sons Sawmill Ondo
	Nig. Romanian Wood Ondo
	S G Bonomi Ltd Jos
	Ugbade Furniture Jos
	Sokoto Furniture Factory
	Keystone Const. Co Ltd Bauchi
	Northern Sawmill Factory Bompai Kano
	Kwara Furniture Ilorin
	Seromwood Ind. Ltd Calabar
	Michael Nnaji Trading Co Enugu
	Central State Workshop Enugu
	Goodell Furniture Enugu
	Calabar Veneer & Plywood Ltd
	Negro Furniture Works Abakaliki
	Katday Modern Furniture Ltd Bauchi

Manufacturing of Pulp Paper & Paper Board	Firms
ISIC Code 3411	Kwara Paper Converters Ltd Ilorin
	Nasco Pack Ltd Jos
	Nigerian Peper Mill Ltd Jebba
	Oyo State Paper Mill Ltd Ibadan
	Abiprint & Pak Ltd Ibadan
	Global Packaging & Paper Ind. Ibadan
	Central Packages of Nig Ltd Ikeja
	Bordpak Premier Packaging Apapa.

[illegible]ube Industry	
ISIC Code 3336	Pamol (Nig) Ltd Lagos
	Odutola Tyre & Rubber Co Ltd, *Ijebu-Ode*
	Michelin (Nig) Ltd P/Harcourt
	Ugochukwu Tyres Ltd Onitsha
	Adeola Rubber Estate; *Benin*
	Odutola Nig Ind. Ltd Ijebu-Ode
	Dunlop (Nig) Ltd, Lagos.

TABLE 2.3 THE REGIONAL SPREAD OF SURVEY SAMPLE

INDUSTRIAL SUBSECTOR	NORTH			WEST			EAST		
	Q	I	U	Q	I	U	Q	I	U
GROUP A: Food Manufacturng	38	45	38	39	53	39	14	17	12
GROUPB : Beverage Industries	12	14	12	12	20	11	3	8	3
CODE 3551 Rubber Products	-	-	-	4	5	4	3	3	2
Tobacco	-	1	-	-	1	-	1	1	1
GROUPS D & E - Textile	5	5	5	7	13	7	7	8	7
GROUP F: Furniture & Fixture	7	8	7	2	2	2	6	6	6
GROUP G: Paper & Paper Products	3	3	3	5	7	5	-	-	-
GROUP H: Leather & Products of Leather	-	1	-	2	2	2	4	4	4
GROUP C:- Tyre and Tube	-	-	-	5	5	5	2	2	2

KEY:

Q- # of questionnaire received.

I- # of companies Surveyed

U-# of questionnaires used in Analysis.

Table 2.4

SAMPLE OF FIRMS BY THE LEVEL OF FOREIGN HOLDINGS

Industry	0 - 20%	21 - 40%	41 - 60%	61 - 80%	Over 80%	Total
Food Manufacturing	76	10	1	-	-	87
Beverage Industries	29	11	-	-	-	40
Rubber Product	5					5
Tobacco	1					1
Textiles	11	1	3	-	-	15
Furniture & Fixture	8	2				10
Paper & Paper Products	4	1				5
Leather & Products of Leather	5					5
[illegible]	5	2	[illegible]	—	[illegible]	5

Source: New Decade Consultants 1984

TABLE 2.5

RESPONDENT FIRMS BY DIFFERENT MEASURES OF SIZE

SOFT DRINK BOTTLING

Name of Firm	Sales Per Annum	Plant Capacity	No Employed (Total	No of Tech. Man Emplo.	% of Tech Employee on Total
1. Lagelu Bottling Co. Ltd Ibadan.	₦2.3 million	900 crate/shift	46	4	8.69%
2. Danta Cola Co. Ltd Kano	₦5.0 million	5000 ctr.p/day	-	5	-
3. Arewa Bottlers Ltd Kaduna	₦32.5 million	25,000 bottle/hr	276	16	5.8%
4. Hilltop Bottling Co. Ltd Jos	₦5.25 million	-	350	6	1.71%
5. Zaki Bottling Co. Ltd Sokoto	₦1.5 million	-	100	12	12%
6. Okin Bottling Co. Ltd Kaduna	₦250,000 - ₦592,000.00	4507 pack/hr.	40	5	12.5%
7. New Food & Drinks Co.Kaduna	₦1.2 million	9000 pouches/hr.	53	8	15.09%
8. Bauchi Bottling Co. Bauchi	₦3.78 million	13200 bottles	-	10	-
9. Lafia Canning Factory Ibadan	₦341985.00	8 tons/day	-	6	-
10. Union Beverages Ltd,Ibadan	-	-	250	10	4%
11. Okada Dry (Nig) Ltd Benin	₦5.4 million	5000 crates/day	235	35	14.89
12. Okada Bottling Plant Kano	-	420 B.P.M	72	17	23.61
13. Bolori Bottling Co. Gombe	₦750,000.00	1200 bottles/shift of 8 hr.	91	11	12.08
14. Drinco Ind. Ltd, Kaduna	₦8.5 million	1000 crates	367	14	3.81
15. Union Beverages Ltd Lagos	₦12.0 million	3.6 million/Yr.	-	35	-
16. Nig. Soft Drink Co. Ikeja	₦17,428,000.00	26,400 Bottles per hour.	646	48	7.43
17. Rexonoh Brewery Ind. Enugu	-	-	-	-	-
18. Garba Bottling Co. Kano	-	15,000 lit.	109	9	8.26%
19. C.H.I. Ltd Ikeja, Lagos	₦4.2 million	9000 pouches/hr.	39	11	28.2%
20. Nigerian Bottling Co. Ltd Ikeja		50,000,000 x 24 bottles per year	3548	165	4.65%

FOOD & CONFECTIONERY

Name of Firm	Sales P.Annun	Plant Cap.	Total Employee.	Tech/Man Employee	% on Total
1. Nig. Assoc. Best Food Ltd Jos.	₦630,000.00	1251tr/hr.	-	8	-
2. Star Sweets Co. Ltd, Kano	₦4054831	-	219	7	3.19%
3. Tate & Lyle Nig. Ltd Ilorin	-	2400ton/mon.	-	23	-
4. Lipton Nig. Ltd. Apapa	₦16.9 million	3500ton/Yr.	815	-	-
5. Ovaltine (W.A) Ltd Ikeja	₦18375000.00	2200 T/Yr.	-	-	-
6. Moon Confectionery Ltd, Kano	₦ -	-	80	4	5%
7. Five Star Bakery, Kano	348000.00	-	40	3	7.5%
8. Tiffany Farms, Auchi	-	-	60	3	5%
9. Adamu Farms, Auchi	-	730 Tons	49	6	12.24
10. Alasinrin Bakery, Jos	₦10,000.00	5000 P/day	70	1	1.42
11. Arowosaiye Bakery, Jos	₦9000.00	5000/day	27	1	3.7%
12. Bagauda Biscuits Co. Kano	₦3.0 million	3500 M.T	-	14	-
13. Obiadi Ezomo Famrs, S/G Ora	-	-	47	1	2.12
14. Congo Bakery Ltd, Benin	-	1000pa/day	61	1	1.64%
15. Malo Works Ltd, Benin	₦584,000.00	2500/day	39	2	5.13
16. Kano Sugar Ind. Ltd Kano	₦4.0 million	-	150	15	10%
17. Quality Foods, Ibadan	₦1.0 million	1800kg/day	-	4	-
18. Yassin Confectionery Co. Kano	₦1.9 million	-	106	6	5.66
19. Midwest Rational Bakery. Benin	-	2500/day	37	3	8.11%
20. Uncle Bens Bakery Benin	-	-	39	3	7.6
21. Nasco Foods Ltd, Jos.	₦20 million	12000Ton/Yr.	603	77	12. 77%

Name of Firm		Plant Cap.	Total Employment	Tech/Man Employee	% on Total
22. Northern Bakeries Ltd, Kaduna	₦1.8million	10,000/day	-	16	-
23. Gusau Bakeries Ltd, Gusau	₦11 ,400.00	3000/day	15	3	20%
24. Champion Confectionery, Kano	₦8.1m.	0.3Ton/day	-	5	-
25. Hallawa Confectionery Ltd,Kano	₦5.m	-	98	4	4.08%
26. Toni-Toni Special Bread, Benin	-	-	-	3	-
27. Tropic Foods Ltd, Benin	-	-	-	13	-
28. Swiftbird Sugar Co. Ltd Ibadan	-	6000 T/Yr.	-	7	-
29. Madara Dairy Co. Vom - Jos	₦1195404.00	6000pkt/day.	88	13	14.77
30. Nig. Dairies Co. Sokoto	₦1345,053.00	-	-	9	-
31. Gusau Sweets Factory Gusau	₦50,000.00	2 ton	200	7	3.5%
32. Bauchi Meat Factory, Bauchi	450,000.00	-	42	-	-
33. Nig. Bisc. Mfg. Co. Ibadan.	-	4450 Ton/Yr.	330	10	3.03%
34. Nig. Sugar Co. Ltd Bacita	₦12 - 18m.	35,000 T/Yr.	6000	40	.67%
35. Veg. & Fruit Processing C. Gombe	₦12.m	700,000 T/Yr.	120	4	3.3
36. Rockwater Fish Farms Ltd, Jos	-	-	23	2	8.7%
37. Hi-quality Bakery Ltd Calabar	₦100,000.00	-	17	1	5.8
38. Chris & Sons Investment	-	-	48	8	16.67
39. Foremost Dairies Ltd, Mushin	-	-	377	27	7.2%
40. Foods Div. of U. A. C. Lagos	-	-	652	41	6.29
41. W/Africa Milk Co. Ltd	₦33,377,135	-	623	60	9.63%
42. Cocoa Ind. Ltd Ikeja	₦7.6m	20247 Ton/Yr.	603	63	10.45%

43. Nig. Pork P. Co. Ltd Nnewi	-	-	13	3	23%
44. Mazi Ejidike Bakery Onitsha	-	-	10	4	40%
45. Ile Oluji Cocoa P. C. Ile-O	-	30,000 Ton/Yr.	300	23	7.67
46. Cocoa Production Ind Ede	₦6.m	-	205	36	17.56%
47. Kano Confectionery Ltd Kano	₦20.m	-	90	12	13.33%
48. Candy Co. Nig. Ltd Kano	-	300,000T/Yr.	124	24	19.35%
49. Niger Biscuit Co. Ltd Apapa	₦42m	25271 Ton	1,193	67	5.62%
50. A.C.Christlieb Nig. Ltd Apapa	₦33.1million	-	1,230	113	9.2%
51. Chido Foods, Ikeja	-	-	49	4	8.2%
BEER BREWERING / DISTILLERIES					
1. Kwara Breweries Ltd Ijagbo	₦7.4m	100,00011/yr.	406	21	5.17
2. Nigerian Breweries Ltd Lagos	₦241m	3.3m.HL/Yr.	4539	351	7.73
3. Sparkling Breweries Ltd	-	-	-	24	-
4. Super Bre. Ltd. Agbara-Oto	-	270,000	408	11	2.7
5. I. B. B. I. Kaduna	₦35million	450,000 H.l/Yr.	535	18	3.36
6. West African Distillers Ltd. Ikeja	₦9.7m	19,000 h.l/yr.	43	11	25.58
7. Amalgamated Distilleries Ltd	₦2.49m	500,000 lit/Yr.	54	8	14.81
8. Guinness Nigeria Ltd Ikeja	₦216 million	2.45 M.HL	2941	576	

OIL SEED CRUSHING

Name of Firms	Sales P. Annum	Plant Capacity	Total Emp.	Tech/Man Employee	% On Total
1. Nig. Oil Mills Ltd Kano	₦75m	250 Ton/day	-	9	-
2. Oil Palm Co Ltd. Auchi	-	8.5 ton/hr.	428	3	.7%
3. Nifor Oil Mill Co. Ltd Benin	₦2.7m	-	182	9	-
4. B. N. Okongwu & Sons Ltd Umuahia	-	-	-	-	-
5. Seed Processing Plant Gombe	-	-	18	1	-
6. Oddy Contracts Ltd, Ibadan	₦6m	-	68	4	5.8%
7. Nimadco Ltd, Kano	₦.8m - ₦1m	100,000 tons	163	13	7.97
8. Kano State Oil & Allied Product Ltd	-	170,000 tons	145	9	6.2
9. The Kano Oil Millers Ltd	₦14.5m	-	57	9	15.78
10. Raad & Fadoul Ltd Kano	-	-	-	10	-
11. Gombe Oil Seed Processors Ltd Gombe	-	200 tons/day	223	43	19.28
12. Oil Palm Co Ltd Sapele	₦2.2m	7tons FAB/Hr.	373	9	2.41
13. Pioneer Oil Mill Okija	-	-	17	3	17.65
14. Pioneer Palm Oil I Nnewi	-	-	19	3	15.79
Vegetable Oils (Nig) Ltd Ikeja	₦5.6m	30,000 M. T P. a.	256	10	3.91%
16. Davog Oil Mill Ltd Akure	-	-	-	-	-

FLOUR/RICE MILLING

	Name of Firm		Plant Cap. T	Employed	Tech/man	%on Total
1.	Northern N.g. Flour Mill Kano	₦86m	900 M.T/day	529	43	8.13%
2.	Nig. Eagle Flour Mills Ibadan	₦16m	200 M.T/day	140	6	4.29
3.	Ideal Flour Mills Ltd Kaduna	₦27m	305.M.T/day	241	17	7.05
4.	Grain Processing Co. Ltd Gombe	-	-	-	-	-
5.	National Grains Prod. Co. Ltd Kad.	-	1.2 M.T/Hr.	-	7	-
6.	Ikwo United Ltd Abakaliki	-	-	27	6	22.2
7.	Uzoma Rice Mill, Abakaliki	₦66,000.00	-	-	-	-
8.	Niger Mills Co Ltd Calabar	-	-	-	9	-
9.	Flour Mills Nig Ltd Apapa	₦247m	2350 M.T/Day	-	383	-
10.	P.N Iwoka & Bros Milling Otuocha	-	-	16	2	12.5
11.	D. O. Akabike Mill Ind.Njikoka	₦500,000.00	-	19	3	15.79
12.	Adarice Prod. Project Ltd Adani	-	-	56	3	5.35
13.	Lisabi Mills Nig. Ltd, Lagos	-	-	-	6	-
	TEXTILES					
1.	United Nig.Text. Ltd, Kaduna	₦150m	36m metres/Yr.	5426	77	1.42
2.	Universal Tex. Ind. Ltd, Kano	₦7.7m	3.6m/yr	-	28	-
3.	Kaduna Textile Ltd, Kaduna	₦19.6m	29.1m metre/yr.	3672	98	2.7
4.	Kano Textile Printers Ltd Kano	₦1.45m	2.5m mtr/Yr.	147	8	5.44
5.	Nig Cotton Board Funtua	₦24.36m	35,000 bales	460	21	4.47
6.	Spintex Milss Ltd Apapa	₦16.m	4200 M.T/Yr.	400	16	4%
7.	Atlantic Textiles Ltd, Lagos	₦13.32m	-	-	52	-
8.	Nig. Textiles Mills Ltd Ikeja	₦25m	21m.metre/yr.	2459	29	1.7%
9.	Chinedu Textile Ind. Abagana	-	-	18	1	5.6
10.	Odua Textile Ind. Ltd Ado Ekiti	₦1.7 m	1.4 m M.T/Yr.	332	23	6.9%
11.	Enpee Industries (Nig) Ltd Lagos	₦37.2m	-	1407	45	3.2%
12.	Kay Industries Ltd Ikeja	₦5.m	-	180	20	11.1%

OTHERS

Name of Firm	Sales.P.Annum	Plant Cap.	Total Employment	Tech/Man Employee	% On Total
1. Fadile Feeds Kabba	-	1.5 ton/lr.	47	3	6.3
2. New Nig. Salt Co. Ltd Sapele	₦6.m	-	-	7	-
3. Eto Agric Ltd	-	-	-	7	-
4. United Plastic Ind. Ltd P/Harcourt	₦3.9 m	-	355	9	2.54%
5. Northern Sawmill Furniture Co.Kano	₦2.m	-	300	9	3%
6. Sokoto Furniture Factory Sokoto	-	-	125	4	3.2%
7. Negro Furniture Works Abakaliki	-	-	-	14	-
8. Peco Feeds Ltd Enugu	₦5.m	8 ton/l	70	6	8.57%
9. Household Products Ltd Jos	₦18.m	2.8 ton/hr	271	46	16.97
10. Oyo State Paper Mill	₦3.2m	-	157	12	7.64
11. Agwu Brothers Aba.	₦60,000.00	-	10	2	20%
12. Katday Modern Furniture Ltd Bauchi	₦1,0 m	-	-	3	-
13. Singlet Ind. Aba	₦180,000.00	1500 p	95	3	3.15
14. Nigeri Garments Mfg. Co. Aba	₦250,000.00	-	-	6	-
15. Keystone Const. Co. Bauchi	₦288,000.00	1 set/wk.	9	8	88.8
116. Ugbabe Furniture Co. Jos	₦1.0m	-	-	4	-
17. Aboprint & Pork Ltd Ibadan	₦600,000.00	-	-	-	-
18. Livestock Feeds Ltd Ikeja	₦31.0m	-	-	-	-
19. Standard Shoe Co. Ltd Owerri	-	-	-	-	-
20. Ajikola Enter. Ltd Ogbomosho	-	100 pais/day	31	1	3.22
21. United Match Co. Ltd Ilorin	₦3355200.00	30ctn/hr.	129	9	6.98
22. Kwara Paper C. Ltd Erin Ile	₦1.m	7.5m books/yr.	165	15	9.09
23. Kwara Furniture Mfg. Co. Ltd	₦1.2m	-	-	10	-
24. Carpet Royal Ltd Ibadan	-	180000 sq.m/yr.	103	10	9.71
25. Global P. & Paper Ind Ibadan	-	19.6m ctn/Yr.	-	12	-
26. General Plastic Ltd P/Harcourt	210,000.00	-	26	6	23%

27. Nasco Pack. Ltd. Jos.	₦12.0 m	10,000 ton/Yr.	248	27	10.89%
28. Offiasco Ltd Aba	₦646412.00	-	57	1	1.75
29. S. G. Bonomi Ltd Jos	20,000.00	-	24	1	4.17
30. Goodif Furniture Co Ltd Enugu	-	-	12	1	8.33
31. Bendel Fod Prod. Board Udo & Odo	₦1.2 m	25 ton	185	9	4.86
32. Bendel Food Prod. Board Agbor	₦3.4m	-	54	4	7.4
33. Bendel Food Prod. Board, Agbede	-	-	114	11	9.65
34. Calabar Veneer & Plywood Ltd	₦11,760,000.00	-	235	13	5.53
35. Seromwood Ind. Ltd. Calabar	₦2.3m	-	-	22	-
36. Central Packages Nig. Ltd Ikeja	₦2.0m	3000 tons/Yr.	143	20	13.79
37. Ugochukwu Tyres Ltd. Onitsha	₦1.5m	-	129	5	3.8
38. Michael Nnajiofor Trad. Co. Enugu	-	-	95	4	4.2
39. Nwoba & Co. Shoe Ind.	-	-		4	5.4
40. Nmuoji Ind. Coop. Ltd Onitsha	-	-	73	5	6.6
41. Ezechukwu Shoe Mfg. Ltd Onitsha	-	-	120	6	5
42. Adazi-Enu Ind. Coop. Ltd Adazi-Enu	-	-	130	3	2.3
43. Varsity Ltd Onitsha	-	-	74	1	1.3
44. Idemili Ind. Ltd Nnobi - Onitsha	-	-	64	5	7.8
45. Central State W/Shop Furniture Co Enugu	-	-	14	1	7.14
46. Okoro Nwokoro Poultry Farm. Abakaliki	-	-	16	2	12.5
47. Akinbolaji & Sons S/Mill Ltd Ondo	₦945,000.00	700 cub.f/day	41	6	14.6
48. Nig. Romanian Wood Ind. Ltd Ondo	-	₦7.m	993	34	3.42
49. Odutola Nig. Ind. Ltd. Ijebu Ode	₦2.2m	685400 tyrrs	315	15	4.76
50. Adeola Farm Estates Ltd. Ijebu Ode	-	350 ton/Yr.	160	10	6.25
51. Odutola Tyre & Rubber Co. Ltd Ibadan	₦600,000.00	1 ton/day	31	4	12.9%
52. Odutola Tyresales Co. Ibadan	₦500,000.00	50/60 tyre/day	50	3	6%
53. Glaxo Nig Ltd Apapa	₦26.4m	-	706	156	22%
54. Bordpak Premier Packaging, Apapa	₦20.m	20,000 T/Yr.	-	82	

Table 2.6 SUMMARY ON ANALYSIS OF HIGH LEVEL TECHNICAL / MANAGERIAL PERSONNEL.

Industry	Engineers		Consultants		Scientists		Technologist		Reserchers		Managerial		Total
	Nig.	Exp.	Nig.	Exp.	Nig.	Exp.	Nig.	Expat.	Nig.	Exp.	Nig.	Expat.	
Soft Drinks	38	17	1		5	1	35	5	1		128	23	254
Food Confectionery /Beberages	118	27	7		17	1	202	20	6		359	28	785
Textiles	57	22	5	3			152	39		1	120	47	446
Oil Seed Crushing	53	7	5	2	14		29	1	1		62	6	180
Flour & Rice Milling	12	36	2	4	7	8	83	16	10		324	17	519
Beer Brewing/ Distilling	633	4	1		64	1	115	4	7		443	4	1276
Others	182	31	134	10	59	8	94	49	14	6	218	24	829
Total	1093	144	155	19	166	19	710	134	39	7	1654	149	4289

TABLE 2.7

RESPONDING FIRMS BY CATEGORY OF EMPLOYMENT.

INDUSTRY	LEVEL OF EMPLOYMENT					
	1-20	21-50	51-200	201-500	over 500	TOTAL
SOFT DRINKS		2	4	4	2	2,526
FOOD & CONFECTIONERY	7	9	9	2	6	11,349
BEER BREWERIES & DISTILLERIES		1	1	2	1	5,450
TEXTILE	1		1	2	2	10,115
OIL SEED CRUSHING	2	-	4	4	-	2,005
FLOUR MILLING & RICE	2	1	2	1	1	1,009
OTHERS	8	7	11	6	-	3,153
TOTAL	20	20	32	21	12	35,607

CHAPTER THREE

THE STOCK OF EXISTING TECHNOLOGY IN NIGERIA'S MANUFACTURING AGRO-BASED SECTOR: INDUSTRY AND PRODUCT LEVEL.

In theory, this is the chapter in which most of the work of stock-taking is presented and reported upon. The specific questions that should be answered in this chapter are:

(a) What kinds of technologies exist in the agro-based subsector of manufacturing?

(b) What are the sources of these technologies?

(c) How were they acquired - in what form (embodied or unembodied) - what arrangements were made for their acquistion?

(d) To what extent were the technologies acquired by the entities surveyed ? (Assimilation)

(e) What level of sophistication was attained by the technology users ?

(f) How would one categorize the existing technologies in the sub-sector ?

(g) What extent of self-reliance has been attained in the subsector ?

(h) What gaps in technology exist in the subsector.

These questions now form the basis of each of the remaining sections of this chapter.

A. TYPES OF TECHNOLOGY EXISTING

There are broadly the following types of technologies available in the agro-based sub-sector:

1. Fruit Canning
2. Biscuit Making
3. Sugar Processing
4. Dairy Production
5. Meat Processing
6. Soft Drinks Bottling
7. Beer Brewing
8. Tobacco Manufacturing
9. Grain Milling
10. Tuber Processing
11. Saw Milling
12. Wooden Furniture Manufacturing
13. Textile Technology
14. Leather Processing
15. Vegetable Oil Crushing
16. Tea Processing
17. Cocoa Products Manufacturing
18. Feed Milling
19. Pulp And Paper Making

The other technologies available to the subsector, but which have not been commercialized fully are those connected with certain baby foods and high protein adult nutrition. All of the technologies are described in some detail, and the current position of the country with regard to ability to innovate is also stated in the Annexure to this chapter. That Annexure is presented in a separate volume.

B. THE SOURCES OF THE TECHNOLOGIES

With few exceptions such as those developed by FIIRO and other research institutions in Nigeria, the bulk of these technologies are imported. The most widely used technologies that are indigenous in this subsector are those connected with gari (cassava) processing; soy-ogi, and palm kernel crushing.

The most important source of technologies in this subsector is the United Kingdom. This obviously derives from the colonial past of the country. The next important source is Western Europe - W.Germany, France, Italy, Switzerland, Holland, Belgium and Spain. The east European countries have become increasingly important sources of Nigeria's technologies lately.

Table 3.1 shows a summary of the number of technologies from the various sources. Details of the sources of the technologies used by each responding entity is given as Table 3.2.

C. MECHANISMS OF TRANSFER

Here we examine the mode of acquisition of the technologies... Normally the various technologies could have been acquired by any of the following mechanisms:

- purchase of machinery, equipment, tools jigs and raw materials
- the transfer of personnel and data from owners to users
- the acquisition of licences, the use of trade marks, and other collaborative agreements

- joint venture investment between foreign owners and local investors
- direct investment by a foreign investor,
- technological enterpreneurship - technologists moving out of established firms to set up their own businesses.

In this agro-based subsector, the most prevalent mode of transfer seems to be purchase of machinery, equipment and other inputs and the employment of technologists experienced in the operation of the purchased facilities. This seems dominant as a mechanism because most of the technologies in use in the subsector seem to be mature technologies in which most of the know-how is embodied in the artifacts of production. This probably explains the low frequency of collaborative agreements in such industries as cotton textile spinning, weaving and finishing, vegetable oilseed crushing saw milling, grain milling, feed milling and the bakery industries.

Collaborative agreements especially

- patent licence agreements
- technical agreements
- trade mark agreements
- management agreements

are dominant in the beer brewing industry. All breweries that responded to our questionnaires had some form of collaborative agreement or the other. This seems to be due to certain proprietary features of the brewing technology

which affect taste, and acceptability of beers. It was found out that most of the breweries had two or more different collaborative agreements. Even the Nigerian Breweries Ltd which started operations in the late forties is not excepted.

In sheer numbers, the food, beverages and tobacco ISIC group has the largest number of technology agreements. But that is also the dominant group in the agro-based subsector.

Joint venture arrangements are also becoming important in the new food processing ventures, in particular those based on meat, fish and dairy production.

Table 3.3 summarizes the mechanisms by which the various technologies were acquired by the recipients. Table 3.4 gives the names of firms seeking NOIP approval for their agreements and the foreign collaborators of the firms. It seems obvious that NOIP does not have a file on all collaborative agreements in this subsector, when we compare Table 3.3 and 3.4.

One feature that will be dealt with in greater detail when policies are examined is the fact that no clear cut reason seems to be responsible for the existence or non-existence of technology agreements in the subsector. In soft drinks for instance

- fruit juices and carbonated waters
- firms with technical agreements co-exist with those without. For most it is the desire to

use a foreign trade mark. In the case of the two big multinationals in the business - the Cocoa-Cola Company and Pepsicola Company the overriding reasons are that

- their trade marks are used by the Nigerian recipient;
- their concentrates, (the formulation of which remains a mystery to their transferees) are used; and

it can be seeen that the know-how in the case of soft drinks is not only embodied in the plant and machinery, the bulk of it is embodied in the concentrates, the formulation of which is never disclosed to recipients.

In some cases exclusive franchise covering the entire country is given - Coca Cola; while Pepsi Company gives different entities franchise in different geographical locations - Arewa Bottlers for Kano and Kaduna, Abiola Bottlers for Ilorin; John Holt Ventures for the rest of the country.

D. THE INTENSITY OF TRANSFER

There are two aspects in the determination of the intensity of the transfer of technology. The first aspect measures the activity of the transferor while the second aspect measures the efforts of the recipent. In the first aspect the recipient receives a set of elements that prepares the entity for beginning production. These elements are:

- of preinvestment study
- machinery and equipment
- detail factory design
- construction and erection of factory and its facilities.
- operation and repair manuals

- training of personnel
- operating, maintenance and management personnel
- supply of raw materials
- supply of spare parts
- other services.

The respondents were required to indicate the percentage of each of these elements that they obtained from the transferor. Their eleven individual percentages were then standardized and expressed as a fraction of 1.0 which is the highest score obtainable if the recipient did not make any contribution into the starting process. The scores of individual respondents are given in the second column of Table 3.5.

The second aspect is theoretically the other side of the same coin; what the recipient contributed to the transfer process. The same procedure for calculating the first measure is used to calculate the second measure. The results are given in the third column of Table 3.5.

The significance of these measures is that they show the extent to which the recipient is prepared by the transferor to start manufacturing. The higher the measure the greater the preparedness. The two scores allow us to make certain statements about the intensity of transfer.

(a) acquisition of technology by an entity in Nigeria does not reduce the intensity of transfer to another entity at a later date.

(b) neither the source nor the recipient is subject to control in the type of technology that can be acquired. This seems clear because there are wide variations in the scores of entities acquiring the same technology in the same environments.

In Table 3.5 a, we have summarized the individual measures of respondents by industry group lines.

E. CLASSIFICATION OF TECHNOLOGY

The classification we have carried out in this study is based on three parts of our questionnaire, as follow:

QUESTION		
13.	(a)	Research and Development Intensity
	(b)	Skill Intensity
	(c)	Equipment Flexibility
16.	(d)	Product Characteristics
	(e)	Frequency of Product CCharge
	(f)	Customer reaction
	(g)	Marketing Strategy
17.	(I)	Production Process
	(II)	Economies of Scale
	(III)	Determinants of Market share

Our conviction is that these three aspects distinguish what is usually called high technology from low technology businesses. The underlying reasoning is now presented in some detail.

High technology is characterized by the high expenditure on research and development. Many technologies, either out of maturity or because R & D is not required show very little R & D expenditure. Secondly, where the know-how required has been embodied in the machinery and equipment of production the skills most required are those of operation and maintenance; on the other hand where the know-how is unembodied, then the emphasis is on design and redesign. The first set of skills those of operation are usually not high. The second set of tasks require the presence of engineers, scientists and other technologists whose main contribution is original thought and human initiative.

Thirdly, equipment that is specific is usually associated with a high degree of embodiment of know-how so that human initiative is progressively reduced the higher the specificity of the equipment. On the other hand, general purpose equipment allows plenty of human knowledge to be used to produce different things. A measure of specificity reveals the sophistication of equipment and is inversely related to low human skill required.

Fourthly, product characteristics, the frequency of product change, the extent to which customer reaction to product change can be predicted and the strategy with which a product is marketed reveal certain underlying facts about the sophistication of the technology.

Lastly, systems of production where the production process is continous, where success depends on large scale

economies and where price is the most critical determinant of market size- all these features are associated with low to medium levels of technological sophistication.

Responses are weighted in an ordinal scale that goes from 2 to 8. i.e increasing in magnitude to reflect increasing technological sophistication.

The individual scores of entities are presented as Table 3.6. The group means are designed to classify technologies showing similar sophistication features on the same points on our ordinal scale.

This classification has shown that most of the entities covered in this survey fall into categories of technological sophistication that are generally called low. What is the significance of this fact?

In order to understand the true implications of this, we have to define technological sophistication more precisely than we have done so far.

Without wasting time and space, one could define technological sophistication on the basis of the element of surprise. A manufacturing business is defined as more or less sophisticated depending on the extent to which the business gives rise to surprises requiring complex human judgement.

The surprises could result from uncertainties about the nature of the product or from inadequate knowledge of the manner in which the product is manufactured or marketed. Or, it may be due to the characteristics of the organisation producing the product. See Table 3.5 for details.

Conversely, a manufacturing business which is characterised by very few surprises and which is routine enough to allow the use of robots or gadgets in place of human operators is defined as low in technoloical sophistication. Often, high capital intensity or embodiment of know-how in the artifacts of production is mistaken for high technological sophistication. This definition corrects that mistake.

Low technological sophistication implies several things:

(i) It means a low rate of innovation''it means that entities surveyed are predominantly engaged in the pure business of reproducing the product and processes of the owners of their technology with little or no modification;

the entities operate more or less in a straight jacket

(ii) It implies that industrial growth does not expand the avenues of employing highly trained engineers, Scientist, researchers and other technologists who are usually responsible for indigenizing borrowed technology;

where these high-level technical personnel are employed, they end up doing routine, administrative work which does not reflect their training.

(iii) The two implications mentioned above give rise to a situation where production facilities within an industry increase in number without giving the country any level of self reliance. This fact may be responsible for the low rate of technology transfer among manufacturers within the country,

in spite of the multiplication of similar facilities engaged in the same industrial products and processes. This implication brings us to the analysis of self reliance.

C. EXTENT SELF RELIANCE ATTAINED

Self -reliance in technological terms has three main components:

(1) It deals with the extent to which an entity has absorbed the acquired technology. It is a measure of the extent to which Nigerians have absorbed all of the elements of technology from conception, feasibility study, factory design, operation, maintenance, procurement to R & D. One over-all percentage score is given. It is also necessary to seperate entities doing R & D locally from those whose R & D is done for them abroad; we must also measure the extend of involvement of the key Nigerians with technology on their own.

(2) Self reliance also refers to the capacity to innovation - it is an attempt to find out to what extent the responding entity can start a new productive facility without recourse to outside help. This ability is closely related to the number of high level technical personnel it employs. This is given as Table 3.8 Degree of self - Reliance.

and one overall persentage score given. The high high the % score, the higher the innovative capacity of the respondent.

(3) The ultimate measure of self-reliance is to examine the concrete evidence in terms of

(i) the number of new products introduced by the respondent endogenously;

(ii) the number of process changes introduced by the materials or other inputs that are scarce or inappropriate;

(iii) modifications to the original product with which recipient started operation.

The measures used here are industry group Arithmetic averages. (Group means) Innovative capacity is measured in Table 3.9.

It seems obvious that technological self-reliance cannot be be achieved if the bulk of the inputs used in any industry is imported. We prefer to deal with this aspect of self reliance when we measure the impact of technology on the economy.

From the two tables presented, it can be seen that the level of self-reliance is very low in the sub-sector of Agro-based manufacturing; in Nigeria. In fact, we believe that the measures understate the degree of self-reliance.

It can be concluded that the extent of self-reliance in the agro-based subsector is very low in view of:

(1) the low self reliance scores shown by each entity surveyed;

(2) the almost total absence of the capacity to create new productive facilities endogenously in all entities

entities surveyed.

(3) the heavy reliance of the bulk of the entities on imported inputs including raw materials, spare parts, and the manufacturing hardware;

(4) the high reliance on expatriates in a number of these establishments, which are some of the oldest in the country and which one would expect to be wholly indigenized by now. It is noteworthly that technical and other forms of technology agreements existing between some of these long-established manufacturers and foreign groups further underscore the serious dependency relationship of these entities. The most serious cases include:

- Nigerian Breweries Ltd
- Lipton (Nig) Ltd
- Lever Brothers (Nig) Ltd
- Guinness (Nig) Ltd
- Thomas Wyatt (Nig) Ltd
- Nigerian Bottling Co. Ltd.

(5) In the case of the soft drinks factories the dependency relationship is, to all practical purposes, permanent, since their technology is base on brand-specific concentrates.

The inevitable conclusion to be drawn from the facts of this survey is that the extent of self-reliance is low; and is unlikely to improve as industrialization grows. The trend seems to be toward greater dependency as industrial activity expands.

H. GAPS IN TECHNOLOGY

Gaps in technology can be defined in different ways The most difficult definition of technology gap is that which is based on the current state of the art in each technology. It defines technology gap in terms of currency. If there are six methods of brewing beer and the most current is the one which combines cost efficiency with time saving in brewing and curing time. If the brewing process in Nigeria is based on this technology, then there is no gap to be filled in the brewing industry. On the other hand if all breweries are based on an absolete process which wastes raw materials and is time-consuming, then we can say that a gap in technology exists to be filled.

This first sense is not the one most useful for the present level of Nigeria's development. More seriously it requires extensive research for any body to identify the technological gaps to be filled in accordance with this definition of a gap.

A second definition of a technology gap is in the sense of problems for which satisfactory technical solutions have not been obtained. In the case of Nigeria a burning issue is the development of mechanical devices for peeling cassava, yams and other tubers as a pre-requisite for industrial production of staple foods such as garri, edible starch, instant yam powder, etc, this definition of a gap is very useful but again is an almost impossible task since it takes

specialists in each of the industries to identify the particular technical problems which are bottlenecks to rapid expansion of production.

The third definition, which we use is to define the technology gap in terms of the elements of existing technologies, which have not been acquired by Nigerians and which can be seen as critical in the process of achieving technological self-reliance. This definition is the most manageable of the three approaches to defining gaps. We also see it as probably the most useful for Nigeria's development.

Accordingly, we see many gaps in Nigeria's technology.

(i) In terms of elements of technology, the following are almost completely missing.

- machinery and equipment design and fabrication
- detail design of manufacturing facilities
- spare parts and accessory fabrication
- research and development connected with
  (a) using local raw materials to produce a widely demanded good such as beer from local grain malts; soft drinks based on locally developed concentrates; fruit juices produced from locally grown high-yield varieties processed into concentrates;
  (b) developing new products from indigenous agricultural raw materials such as parboiled local rice. corn beef from local meat; bread flour from blending tubers and local

grains; In this regard we note the pioneering work of the Deebee Company in Ibadan which has successfully developed and commercialized various wines from Kolanuts and potable alcohol.

(c) adapting standard machinery and equipment to meet pressing local needs;

(d) changing standard or imported products to suit local conditions tastes or needs;

(e) high quality dehydration technology for dealing with harvest glut and spoilage in tubers and other Nigerian staple foods;

(f) development of low-cost technology for the curing and atmospheric storage of food crops on a small scale, also to deal with spoilage and glut at the peasant farm level;

(g) development of multipurpose small-scale food processing plants;

(h) development of natural fruit concentrates in the production of non-alcoholic beverages and the development of local concentrates as substitutes to imported brands of synthetic concentrates;

(i) development of solardriers for preserving farm products and preparing them for processing.

These observations are without prejudice to the work of FIIRO and other research organisations developing the country's technology base. What we see as gaps is that these desirable features are not taking place in industry.

Table 3.1

SUMMARY TABLE : SOURCES OF TECHNOLOGY

Industry	No. of Firms	U.K	W/Germany	Italy	U.S.A	France	Benelux	Other
Food Manufacturing	87	15	15	4	5	6	7	33
Beverage Industries	40	11	11			5	1	4
Rubber Products	5	1	2			1		1
Tobacco	2	1			1			—
Textile	15	3	1		1	1		9
Furniture & Fixture	10	1	2	2		1		4
Paper & Paper Products	5		1					4
Leather & Products of Leather	5	3		1				1

Source: New Decade Consultants 1984

Table 3.2 SUMMARY TABLE

MECHANISMS BY WHICH THE VARIOUS TECHNOLOGIES WERE AQUIRED BY THE RECIPIENTS.

	Number of Recipients	Trade Mark	Patent Licence	By Direct Purchase of Inputs.
Food Confectionery/Beverages	89	17	13	59
Soft Drinks Bottling	20	14	2	4
Beer Brewing/ Distilling	8	5	3	
Furniture & Fixtures	15	2	1	12
Textiles	19	6		13
Paper & Paper Products	8	1	2	5
Tobacco	3	2		1
Leather & Leather Products	5	1		4
Rubber Products	5	2		3
Total	172	50	21	101

TABLE 3.3

COMPANIES SEEKING NOIP APPROVAL FOR THEIR AGREEMENTS
AGRO-ALLIED SUB-SECTOR.

	FIRMS	FOREIGN PARTNER
1.	Sona Breweries Ltd Otta	Brasseries Kronenbourg
2.	Golden Guinea Breweries Ltd	Coutinho Caro & Coy W/Germany
3.	Pabod Breweries Ltd P/Harcout	Haase-Braierei GMBH W/Germany.
4.	Unazon Breweries Ltd Owerri	Technoexport Foreign Trade Coy Ltd Czechoslovakia
5.	International Breweries Ltd	Haase-Brauerei GMBH W/Germany.
6.	Mopa Breweries Ltd	Peter Rowland Ltd Cheshire
7.	Nigerian Breweries Ltd	Heineken Technisch Beheer. Euroconsult BV Netherlands
8.	Standard Breweries (Nig) Ltd	El-Agulla Spain
9.	Continental Breweries Ltd	Brew-eperts Ltd England
10.	Bendel Brewery Ltd	Austroplan Austrian Engineering Co. Ltd Vienna, Austria
11.	Gongola Brewery Ltd	Cereken, Danish Food Technologists Ltd Denmark
12.	King Breweries & Food Products Ltd	Steenland Ltd London.
13.	Guinness Nig. Ltd	Guinness Overseas Ltd London
14.	Owena Mills Coy Ltd ONdo	JAN Schoemaker B.V The Netherlands.
15.	Spintex Mill (Nig) Ltd	P.H Management Consultants Ltd Jersey.
16.	Blanket Manufacturer Co. Ltd	P.H Management Consultant Ltd Jersey.
17.	Nigerian Ropes Ltd	Bridon Steel Ltd.
18.	Neci Danish Dairy Co. Ltd Enugu.	Danish Turnkey Daries Ltd Denmark.
19.	Ubanibras Farms Ltd	Grandja Agroric Ltd Brazil
20.	Seagems Ltd Ikeja	Hendon Ind. Inc. Switerland.
21.	Cocoa Industries Ltd	Industries De Chocolate Brazil
22.	ovaltine (W.A) Ltd	Wnder S.A. Berne Switzerland
23.	Niger Biscuit Coy Ltd	Oxford Biscuits UK.
24.	Rema Agricultural Prod. Ltd	Hungary
25.	West Africa Milk Co.	Cooperative Condensfabriek Holland
26.	Lipton Nig. Ltd Apapa	Lipton Tea Coy Ltd UK.
27.	Nibeltex Ind. Ltd Aba	Gunne Webmaschinen Fabrik GMH & Co. W/Germany.
28.	Nigerian Textile Mills Ltd Lagos	Textilconsult S.A
29.	Star Paper Mills Ltd	Herlitz Consult GMH W/Germany.
30.	Nigerian Tobacco Ltd	British-American Tobacco Coy London & Benson & Hedges (Overseas) Ltd.
31.	Nabegu Coy Ltd	Colomer Leather International Promotion S.A Spain
32.	Peacock Modern Interiors Ltd	Electroloid Ltd England.
33.	Standard Flour Mills Ltd	A Sciete De Management Et De developpement des Industries Alimentaires France.

Table 3.4

SCORES ON THE INTENSITY OF TRANSFER

	Name of Firm	Acquirement from the Transferor	Nigerianisation of Tech.
1.	Ideal Flour Mills Ltd	.50	.37
2.	Ikwo United (FMCS) Ltd		.43
3.	Uzoma Rice Mill	.07	.32
4.	Northern Nigeria Flour Mills	.68	.56
5.	Nig Eagle Flour Mills Ltd	.69	.38
6.	Grain Processing Co. (Nig) Ltd	.62	.43
7.	Nig. Grains Production C.	.66	.52
8.	Niger Mills Co. Ltd Calabar	.50	.06
9.	Flour Mills of Nig Ltd	.38	.51
10.	Adarice Prod. Project Ltd Adani		.80
11.	D. O. Akabike Mill Ind. Njikoka	.06	.40
12.	P.N.Iwoka & Bros Milling Otuocha	-	.45
13.	Lisabi Mills Nig. Ltd Lagos	-	.41

OIL SEED CRUSHING

	Name of Firm	Acquirement from transferor	Nigerianisation of Tech.
1.	Nifor Oil Mill Co. Ltd	.31	.72
2.	Oil Palm Co. Ltd (E	-	.64
3.	B.N.Okongwu & Sons Ltd	-	-
4.	Nig Oil Mills Ltd	.21	.59
5.	Seed Processing Plant	-	.25
6.	Oddy Contracts Nig Ltd	-	.52
7.	Nimadco Ltd	.50	
8.	Kano State Oil & Allied Products	.53	.39
9.	The Kano Oil Mills Ltd	-	.24
10.	Raad & Fadoul Ltd	.54	.63
11.	Gombe Oil Seed Processors Ltd	.65	.35
12.	Oil Palm Co Ltd Gowan Estate	-	.25
13.	Vegetable Oil (Nig) Ltd Lagos.	0.80	.50
14.	Pioneer Palm Oil Nnewi		.32
15.	Pionner Oil Mill Okija		.53
16.	Devog Oil Mills Ltd, Akure	.5	.42

SOFT DRINKS BOTTLING

	Name of Firm	Question 7c Acquirement from transferor	Nigerianisation of Tech.
1.	Lafia Canning Factory	.43	.45
2.	Okada Bottling Plant Kano Ltd	.43	.43
3.	Danta Cola Co. Ltd	.75	.55
4.	Lagelu Bottling Co. Ltd	.61	.18
5.	Union Beverages Ltd	.06	.34
6.	Okada Dry Nig Ltd	.71	.51
7.	Bauchi Bottling Co. Ltd	.70	.43
8.	Bolori Bottling Co. Ltd	.87	.50
9.	Hilltop Bottling Co. Ltd	.51	.48
10.	Nigeria Soft Drinks Co. Ltd	.52	.50
11.	Okin Bottling Co. Ltd	.52	.78
12.	New Food & Drinks Co. Ltd	.54	.37
13.	Drinco Industries Ltd	.66	.29
14.	Arewa Bottlers	.71	.54
15.	Zaki Bottling Co. Nig. Ltd	.90	.75
16.	Union Beverages Ltd		.15
17.	Rexonoh Brewery Ltd Enugu		.41
18.	Garba Bottling Co. Ltd Kano.	.35	.45
19.	C. H. I. Ltd Ikeja	.82	.37

FOOD & CONFECTIONERY

	Name of Firm	Question 7 c Acquirement from transferor	Nigerianisation of Tech.
1.	Vegetable & Fruit Processing Plant	.85	.65
2.	Alasinrin Bakery Ltd	.37	.32
3.	Champion Confectionery C. Nig.	-	.45
4.	Nasco Foods (Nig) Ltd	.43	.55
5.	Madara Dairy Co. Ltd	.80	.38
6.	Congo Bakery Ltd	-	.28
7.	Tiffany Farms	-	.44
8.	Tropic Foods Limited	-	.63
9.	Uncle Bens Bakery	-	
10.	Toni Toni Special Brown Bread	-	.42
11.	Malo Works Ltd (Bakery Division)	-	.03
12.	Midwest Rational Bakery	-	-
13.	Chiadi Eromo Farms	-	.31
14.	Adamu Farms Ltd	-	.03
15.	Ovaltine (W.A) Ltd	.25	-
16.	Lipton of Nig Ltd	.71	.72
17.	The Nigerian Sugar Co. Ltd	.37	.57
18.	Tate & Lyle (Nig) Ltd	.86	.69
19.	Bauchi Meat Factory	.06	.32
20.	Nigeria Dairies Co. Ltd	.73	.47
21.	Gusau Sweets Factory	.56	.78
22.	Gusau Bakery Ltd	.31	.41
23.	Nig. Associated Best Foods Ltd	.51	.52
24.	Arowosaiye Bakery	.31	.33
25.	Rock Water Fish Farms Ltd	-	-
26.	Bagauda Biscuits Co. Ltd	-	.5
27.	Yassin Confectionery Co. (Nig) Ltd	.67	.72
28.	Moon Confectionery Ltd	.50	.17
29.	Five Star Bakery	.12	.13
30.	Star Sweets Co. Ltd	.47	.43
31.	Halawa Confectionery (Nig) Ltd	.50	.46

32.	Kano Sugar Ind Ltd	.56	57
33.	Swift Bird Sugar Co. Nig. Ltd	.90	.19
34.	Nigerian Biscuits Mfg. Co.Ltd	.51	.76
35.	Quality Foods	-	.58
36.	Northern Bakeries Nig. Ltd	.40	.85
37.	Hi-Quality Bakery Ltd 34, Marian Rd Calabar	.35	.27
38.	Krisandsms Ind. Ltd M.C.C. Road, P. O. Box 614 Calabar	.47	.49
39.	Food Div. of U A C Lagos	.2	.63
40.	West Africa Milk Co. (Nig) Ltd	.62	.09
41.	Cocoa Ind. Ltd Ikeja	.1	.72
42.	Foremost Dairies Nig. Ltd	-	.34
43.	Mazi Ejidikes & Sons Bakery Onitsha.		.43
44.	Niger Pork Prod. Ltd, Nnewi		.31
45.	Ile Oliyi Cocoa Prod. C. Ltd Ile Oliyi	.75	.56
46.	Cocoa Products Ind. Ltd	.69	.76
47.	Candy Co. (Nig) Ltd, Kano	.50	.63
48.	Kano Confectionery Ltd, Kano	.61	.39
49.	Niger Biscuit Co. Ltd Apapa	.53	.50
50.	A. C Christlieb Nig. Ltd Apapa	.63	.59
51.	Chido Foods Ikeja		13.

BEER BREWERIES

		Question 7 c Acqurement from transferor	Nigerianisation of Tech.
1.	Nigerian Breweries Ltd	.50	.60
2.	Kwara Breweries Ltd	.63	.42
3.	Spankling Brewery Ltd	-	-
4.	Sperbru	.22	.24
5.	West African Distillers Ltd	.57	.71
6.	Amalgamated Distilleries of Nig Ltd	.69	.55
7.	I B B I . Ltd Kaduna	1.00	.63
8.	Guinness Nig Ltd Ikeja	.50	.75

TEXTILES

1.	Universal Textile Ind. Ltd	.60	.53
2.	Kaduna Textiles Ltd	.89	.36
3.	Kano Textile Printers Ltd	.15	.52
4.	Nigerian Cotton Board	.62	.81
5.	Spintex Mills Nig. Ltd	.25	.23
6.	United (Nig) Textiles	.89	.74
7.	Nig. Textile Mills Ltd	.96	.63
8.	Altantic Textile Mfg. Co.	.51	.74
9.	Chinedu Textile Ind. Abagana.		.53
10.	Odua Text. Ind. Ltd. Ado Ekiti	.88	.53
11.	Epee Ind. Nig. Ltd Lagos.	.90	.62
12.	Kay Ind. Nig. Ltd Ikeja	.56	.56

OTHERS

	Name of Firm	Question 7c Acquirement from Transferor	Nigerianisation of Tech.
1.	Eto Agricultural Ltd	.29	.26
2.	Fadile Feeds	.36	.41
3.	New Nigerian Salt Co. Ltd	.12	.36
4.	United Plastic Industries (NIg) Ltd.	.41	.64
5.	Northern Sawmill Furniture Mfg.	.65	.15
6.	Sokot Furniture Factory	.37	.31
7.	Negro Furniture Works	-	.56
8.	Pew Feeds Ltd	-	.35
9.	Household Products Limited	.36	.73
10.	Oyo State Paper	-	.72
11.	Agwu & Brothers	-	.30
12.	Katday Modern Furniture Ltd	.48	.31
13.	Singlet Industry	.12	.28
14.	Niger Garments Mfg. Co. Ltd	-	.69
15.	Keystone Const. Co. Ltd	.50	.65
16.	Ugbabe Furniture Co. Ltd	-	.68
17.	Abiprint & Pak Ltd	-	.47
18.	Livestock Feeds Ltd	.12	.46
19.	Standard Shoe Co. Ltd	-	.43
20.	Carpet Royal (Nig). Ltd	-	.56
21.	Global Packaging & Paper	.65	.41
22.	General Plastic (Nig) Ltd	-	.06
23.	Nasco Pack Ltd	.62	.53
24.	Offiasco Ltd	.26	.13
25.	S. G. Bonomi Ltd	.12	.26
26.	Goodell Furniture Co. Ltd	-	.06
27.	Bendel Food Production Board	-	.32
28.	Bendel Food Production Board	-	.18
29.	Bendel Food Production Board	-	.18
30.	Ajikola Ent. Ltd	.68	.29
31.	United Match Co. of Nig. Ltd	.42	.39
32.	Kwara Paper Converters Ltd	.70	.43

33.	Kwara Furniture Mfg. Co.	.50	.53
34.	Seromwood Ind. Ltd P. O. Box 453, Calabar	.82	.37
35.	Calabar Veneer & Plywood Ltd P. O. Box 333, Calabar	.67	.43
36.	Central Packages of Nig. Ltd	.52	.57
37.	Michael Nnajiofor Trad. Co. Enugu		.31
38.	Ugochukwu Tyres Ltd, Onitsha	.21	.5 2
39.	Nwoba & Co Shoe Ind. Onitsha		.53
40.	Idemili Ind. Ltd Nnobi-Onitsha		.45
41.	Central State W/Shop Fur. Enugu		.42
42.	Varsity L Ind. Onitsha		.28
43.	Adazi-Enu Ind. Coop. Ltd Adazi-Enu		.38
44.	Ezechukwu Shoe Co. Onitsha		.31
45.	Umuoji Ind. Coop. Ltd Onitsha		.43
46.	Okoro Nwokoro Poultry Farm , Abakaliki		.40
47.	Nig/Romanian Wood Ind Ltd Ondo	.49	.57
48.	Akinbolaji & Sons S/mill Ltd Ondo	.31	.25
49.	Odutola Tyresales Co. Ltd Ibadan	.50	.53
50.	Odutola Tyre & Rubber Co. Ibadan	.56	.58
51.	Adeola Farm Estates Ltd Ijebu Ode		.53
52.	Odutola Nig Ind. Ltd Ijebu Ode	.89	.58
53.	Glaxo Nig. Ltd Apapa.	.88	.76
54.	Bordpak Premier Packaging Apapa		.78

TABLE 3.4a
Table 3.4a

SCORES ON THE INTENSITY OF TRANSFER

SUMMARY TABLE - GROUP AVERAGES

	Acquirement from the Transferor	Nigerianisation of Tech.
Flour & Rice Milling	.46	.43
Oil Seed Crushing	0.50	.39
Soft Drinks Bottling	.59	.44
Beverages Food, Confectionery	.53	.43
Beer Brewing/Distilling	.51	.55
Textiles	.65	.56
Others	.46	.42

Table 3.5

EXTENT OF TECHNOLOGICAL SOPHISTICATION OF INDIVIDUAL REPONDENTS, 1984

Soft Drinks	Technology Sophistication Scores
1. Lafia Canning Factory	0.67
2. Okada Bottling Plant Kano Ltd	0.41
3. Danta Cola Co. Ltd	0.25
4. Lagelu Bottling Co. Ltd	0.41
5. Union Beverages Ltd	0.42
6. Okada Dry Nig. Ltd	0.43
7. Bauchi Bottling Co. Ltd	0.36
8. Bolori Bottling Co. Ltd	0.46
9. Hilltop Bottling Co. Ltd	0.25
10. Nigeria Soft Drinks Co.	0.47
11. Okin Bottling Co. Ltd	0.47
12. New Food & Drinks Co. Ltd	0.46
13. Drinco Industries Ltd	0.38
14. Arewa Bottlers	0.46
15. Zaki Bottling Co. Ltd	0.46
16. Union Beverages Ltd	0.31
17. Rexonoh Brewery Ltd Enu	0.47
18. Garba Bottling Co Ltd Kano	0.47
19. C. H. I. Ltd Ikeja	0.33

Note: This score is an arithmetic mean of the individual score on the ten parameters of sophistication listed on page 50 above. The higher this score the higher the sophistication.

Table 3.5 contd.

EXTENT OF TECHNOLOGICAL SOPHISTICATION OF INDIVIDUAL RESPONDENTS, 1984.

	Rice and Flour Milling	Scores
1.	Ideal Flour Mills Ltd	0.44
2.	Ikwo United (FMCS) Ltd	0.34
3.	Uzoma Rice Mill	0.30
4.	Northern Nigeria Flour Mills	0.46
5.	Nig. Eagle Flour Mills Ltd	0.39
6.	Grain Processing Co. (Nig) Ltd	0.38
7.	Nig. Grains Production Co.	0.26
8.	Niger Mills Co. Ltd Calabar	0.45
9.	Flour Mills of Nig Ltd	0.42
10.	Adarice Prod. Project Ltd Adani	0.47
11.	D. O. Akabike Mill Ind. Njikoka	0.41
12.	P. N. Iwoka & Bross Milling Otuocha	0.32
13.	Lisabi Mills Nig. Ltd Lagos.	0.39

TABLE 3.5 Contd.

FOOD & CONFECTIONERY

	Name of Firm	SCORES
1.	Vegetable & Fruit Processing Plant	0.46
2.	Alasinrin Bakery Ltd	0.30
3.	Champion Confectionery C. Nig	0.33
4.	Nasco Foods (Nig) Ltd	0.51
5.	Madara Dairy Co. Ltd	0.32
6.	Congo Bakery Ltd	-
7.	Tiffany Farms	0.23
8.	Tropic Foods Limited	0.38
9.	Uncle Bens Bakery	0.37
10.	Toni Toni Special Brown Bread	-
11.	Malo Works Ltd (Bakery Division	0.25
12.	Midwest Rational Bakery	-
13.	Chiadi Eromo Farms	0.25
14.	Adamu Farms Ltd	0.39
15.	Ovaltine (W.A) Ltd	0.63
16.	Lipton of Nig Ltd	0.45
17.	The Nigerian Sugar Co. Ltd	0.55
18.	Tate & Lyle (Nig) Ltd	0.25
19.	Bauchi Meat Factory	0.46
20.	Nigeria Dairies Co. Ltd	0.67
21.	Gusau Sweets Factory	0.27
22.	Gusau Bakery Ltd	0.38
23.	Nig. Associated Best Foods Ltd	0.26
24.	Arowosaiye Bakery	0.17
25.	Rock Water Fish Farms Ltd	0.33
26.	Bagauda Biscuits Co. Ltd	0.52
27.	Yassin Confectionery Co. (Nig) Ltd	0.29
28.	Moon Confectionery Ltd	0.25
29.	Five Star Bakery	0.44
30.	Star Sweets Co. Ltd	0.44
31.	Halawa Confectionery (Nig) Ltd	0.38

TABLE 3.5 Contd

		SCORES
32.	Kano Sugar Ind Ltd	0.41
33.	Swift Bird Sugar Co. Nig. Ltd	0.29
34.	Nigerian Biscuits Mfg. Co.Ltd	0.68
35.	Quality Foods	0.52
36.	Northern Bakeries Nig. Ltd	0.57
37.	Hi-Quality Bakery Ltd 34, Marian Rd Calabar	0.28
38.	Krisandsms Ind. Ltd M.C.C. Road, P. O. Box 614 Calabar	0.45
39.	Food Div. of U A C Lagos	0.54
40.	West Africa Milk Co. (Nig) Ltd	0.46
41.	Cocoa Ind. Ltd Ikeja	0.63
42.	Foremost Dairies Nig. Ltd	0.27
43.	Mazi Ejidikes & Sons Bakery Onitsha.	-
44.	Niger Pork Prod. Ltd, Nnewi	0.34
45.	Ile Oliyi Cocoa Prod. C. Ltd Ile Oliyi	0.41
46.	Cocoa Products Ind. Ltd	0.42
47.	Candy Co. (Nig) Ltd, Kano	0.37
48.	Kano Confectionery Ltd, Kano	0.41
49.	Niger Biscuit Co. Ltd Apapa	0.52
50.	A. C Christlieb Nig. Ltd Apapa	—
51.	Chido Foods Ikeja	—

TABLE 3.5 Contd. OIL SEED CRUSHING

	Name of Firm	SCORES
1.	Nifor Oil Mill Co. Ltd	0.60
2.	Oil Palm Co. Ltd (E	0.50
3.	B.N.Okongwu & Sons Ltd	-
4.	Nig Oil Mills Ltd	0.41
5.	Seed Processing Plant	0.21
6.	Oddy Contracts Nig Ltd	-
7.	Nimadco Ltd	0.37
8.	Kano State Oil & Allied Products	0.33
9.	The Kano Oil Mills Ltd	0.25
10.	Raad & Fadoul Ltd	0.25
11.	Gombe Oil Seed Processors L	0.41
12.	Oil Palm Co Ltd Gowan Estate	0.50
13.	Vegetable Oil (Nig) Ltd Lagos.	0.31
14.	Pioneer Palm Oil Nnewi	0.21
15.	Pionner Oil Mill Okija	0.29
16.	Lovog Oil Mills Ltd, Akure	0.50

TABLE 3.5 Contd.

BEER BREWERIES

		SCORES
1.	Nigerian Breweries Ltd	0.61
2.	Kwara Breweries Ltd	0.57
3.	Spankling Brewery Ltd	0.43
4.	Sperbru	0.46
5.	West African Distillers Ltd	0.44
6.	Amalgamated Distilleries of Nig Ltd	0.47
7.	I B B I . Ltd Kaduna	0.48
8.	Guinness Nig Ltd Ikeja	0.59

TEXTILES

1.	Universal Textile Ind. Ltd	0.46
2.	Kaduna Textiles Ltd	0.41
3.	Kano Textile Printers Ltd	0.33
4.	Nigerian Cotton Board	0.25
5.	Spintex Mills Nig. Ltd	0.31
6.	United (Nig) Textiles	0.58
7.	Nig. Textile Mills Ltd	0.56
8.	Altantic Textile Mfg. Co.	0.37
9.	Chinedu Textile Ind. Abagana.	0.30
10.	Odua Text. Ind. Ltd. Ado Ekiti	0.43
11.	Lapee Ind. Nig. Ltd Lagos.	0.46
12.	Kay Ind. Nig. Ltd Ikeja	0.58

TABLE 3.6 CLASSIFICATION OF TECHNOLOGY

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
Food Confectionery/Beverages	10.99	10.58	13.69	35.26	11.75	.39	0.07
Oil Seed Crushing	3.97	3.74	3.88	11.59	3.86	.35	0.10
Textiles	4.39	4.72	4.95	14.06	4.68	.39	0.11
Soft Drinks Bottling	5.22	3.8	6.22	15.24	5.08	.42	0.12
Flour & Rice Milling	2.89	2.57	2.59	8.05	2.68	.33	0.11
Beer Brewing/Distilling	1.63	1.37	1.64	4.64	1.54	.38	0.19
Others	12.46	13.7	15.56	41.72	13.9	.42	0.073

(i) - Research And Development Intensity

(ii) --Product Market

(iii) - Production Technology

(iv) - Total

(v) - Group Mean

(vi) - Arithmetic Mean

(viii) - Standard Error of Mean

On a scale ranging from 0.0 to 1.0, the industry groups lie between 0.33 (flour milling) to 0.42 (the others group).

Given the three categories of

0.0 to 0.33 as low technology

0.34 to 0.66 as medium technology and

0.67 to 1.00 as hig technology

It can be seen that the business fall on the low end of the scale.

CHAPTER FOUR

SCOPE, COSTS AND EFFECTS OF TECHNOLOGY TRANSFER IN NIGERIA

Chapter Three treated some of the details obtained in the survey at the level of individual entities. Chapter four is designed to present other details not treated in chapter Three, and then to collect the details together in order to present a sectoral pattern.

In accordance with the suggested format, this chapter deals with the following issues:-

(a) Modes of transfer and the cost of technology acquired

  (i) Details of the contractual arrangement for the transfer of technology.

  (ii) Modes of payments - fees, royalties, others

  (iii) Any other hidden costs.

  (iv) Comparision of direct payments with cost of imports and R & D.

(b) The effects of technology acquisition in the agro-based sub-scector.

  (i) The employment effect.

  (ii) the scope of manpower training and development,

  (iii) effects on R and D effort.

  (iv) the extent of import depndency,

  (v) the impact on the growth of manu ctured exports.

Each of these issues is now analysed in the background of the results obtained from the survey.

A. TECHNOLOGY TRANSFER AND COSTS

(i) Details of The Contractual Arrangements For The Transfer of Technology.

As earlier discussed, the bulk of the technologies in the agro-based sub-sector are not covered by any c tractual agreements. Our Table 3.2 shows that 101 of the 172 respondents whose questionnaires we ahalysed acquired their technology by direct purchase of machinery and equipment, without any form of contractual agreement with owners of technology. Their technology is embodied in the artifacts of production.

Of the 71 respondents who had contractual technology agreements 50 used foreign trade marks and 21 utilised a patent licence. There were other forms of agreemnet by the recipients these include:

- Managemnet agreements
- Technical agreements
- Purchase agreements
- ad hoc services agreements

We have examined these agreements and have summarized the major provisions in Table4.1 below. Our examination of the agreements reveals the following general patterns:

(1) It seems obvious that manufacturers relying on technical patents whose agreements have been reviewed, co-exist with others who have merely acquired their know-how by purchasing machinery and equipment.

(2) Technology agreements seem to be concentrated on the acquisition of hardware, maintenance manuals and other operational aspects to the almost total exclusion of such elements as

- Factory design
- Equipment design
- Product design and redesign
- Equipment fabrication
- Technical Management
- Research and Development

(3) There seems to be a predominance of quite superfluous management agreements, especially those contracted by some of the oldest manufacturing firms in the country, such as Lever Brothers (Nig) Ltd, Nigerian Breweries Ltd, Lipton of (NIG) Ltd, Nigerian Tobacco Co. Ltd and similar Old firms;

(4) It is clear to us that other technology agreements do not display any special features to warrant the duration of the agreements; as noted earlier on the technologies can be generally characterized as low. This raises doubts as to the need for technical agreements.

(ii) MODES OF PAYMENTS

Payment for technology is usually in two parts. Payments to owners or transferors of technology and costs to the economy at large. The costs to the recipient are measured in terms of all direct payments to owners in terms of royalties, trade mark fees, management fees, salaries and emoluments of expatriate personnel and differences due

to transfer pricing of inputs from the transferor.

From the point of view of the economy, differences due to transfer pricing are important since they measure some of the foreign exchange costs to the economy due to unfair pricing of inputs. In addition, clauses in the technology agreements, which limit the activities of the recipients so that they forego certain benefits which would have accrued to the economy, are important costs.

We have tried to compile the direct costs of technology in the format agreed with the clients and their monitors, on the one hand and the other consulting groups, on the other hand. That is given as Table 4.2 below.

Although NOIP wanted the format given, the distinction between one kind of cost and another is not clear-cut. Totals under the various headings are therefore not accurate. The following generalizations seem valid with respect to direct costs.

(1) there are large differences in the costs agreed for similar technologies by the parteis to the agreements; the indication is that without the existence of the NOIP Office large amounts of money would have been lost to the economy through unjustifiable technology payments;

(2) the same transferors charge different recipients differently for the same technology, without any justifiable reason for the differences; this is most common in the brewing industry;

(3) it has become a norm that new investments or expansion to existing facilities result in new technology agreements and payments for know-how;

this is true for new manufacturers as well as for the first set of facilities to be established in Nigeria.

(4) in the agro-based sector, the brewing industry is the largest cost centre in technology imports.

(5) the direct cost of technology in the form of actual payments to transferors has not been ascertained because of the difficulties we have experienced in collecting actual data on these from the central Bank. In view of the current difficulties of making foreign exchange payments we suspect that actual payments will be a small fraction of what is due on the basis of the agreements current.

(iii) HIDDEN COSTS.

With respect to indirect costs, we have examined the input imports of the respondents covered in our survey. After repeated efforts, it is our conclusion that it is almost impossible to establish the exact magnitude of over pricing of inputs through transfer pricing. The likely areas of overpricing are:

- wheat imports by flour mills
- soft drink concentrates
- malt or barley imports for breweries
- high-grade tobacco leaf imports for blending
- tea imports
- evaporated milk imports for repackaging

In order to establish the exact extent of overpricing the respondents must be willing to give exact information on prices, quantities (or values). Most respondents give information on quantities but not on prices. In other cases values are given without any indication on quantities. The second constraint is the fact that some of the inputs are proprietary and so are not freely traded internationally; comparative figures are therefore not available for them. This applies most importantly to soft drink concentrates, tobacco leaf for blending.

We examined limiting clauses in the technology agreements available to us and we found the following as most prevalent:

(1) Clauses that limit market franchise. This may be an important constraint to the development of exports of

(a) soft drinks in spite of the large numbers of the establishments over the years

(b) Nigerian lager beers

(c) Cigarettes and tobaccos

(d) tea and other beverages.

An alternative explanation for the non-development of exports of these products is that their producers operates in a sellers market at present where customers bribe, and pay large deposits to buy all that can be produced for local consumption.

(2) Clauses that appropriate to the transferor innovations by the recipient; (These clauses are largely ineffective at present because the

Nigerian recipients do very little R & D that can lead to innovation. NOIP is doing a lot to expunge such clauses from agreements referred to it, wherever they occur).

Other hidden costs that could be quite substantial are those costs that relate to the local upkeep of personnel deployed by the transferor to the recipient. In 19 of the 35 agreements examined, we found clauses that require the recipient to provide

- Free furnished accommodation or pay all hotel bills for the duration of their stay.
- free transportation, (in most cases, number of chauffeur-driver cars are specified;)
- free medical care in Nigeria including clinical attendance, dentures and artificial limbs;
- free return airfares for all transferors' personnel and their families - in some cases the number of return journeys are specified

(IV) COMPARISON OF DIRECT PAYMENTS WITH COST OF IMPORTS AND RESEARCH AND DEVELOPMENT.

The rationale for requiring this comparison is not clear. However, the fact that the exact amounts of the direct payments have not been ascertained makes any comparison a purely hypothetical issue. We have shown that R & D expenditure in agro-based manufacturing in Nigera is negligible.

By far the biggest direct cost of imported technology in Nigera is the cost of machinery, equipment, spare parts and other imported inputs. A compilation of these costs from the information available to us is presented in Table 4.3

Because the bulk of technology used in this sub-sector is embodied, an analysis of the cost of production hardware and raw materials may reveal the true cost of technology, much more than the more elusive scrutiny of technology agreements. Any efforts that help to control the cost of machinery, equipment, tools, jigs and fixtures, raw materials and supplies are more likely to save the economy a multiple of what could be saved from knit-picking the hidden costs embeded in technology agreements.

At present, we do not seem to have any mechanism of international comparison of the cost of these hardware, NOIP can pioneer developments in this area.

6. THE EFFECTS OF TECHNOLOGY ACQUISITION IN THE AGRO-BASED SUBSECTOR ON THE NIGERIAN ECONOMY

(i) The Employment Effects

The agro-based subsector has the greatest potential for direct and indirect employment in Nigeria's manufacturing because of the sheer size of employment in agriculture. Since it is estimated that over 80% of gainfully employed Nigerians are based on agriculture, one would expect the agro-based industries to reflect this.

Table 4.4 gives the industry break-down of employment in the agro-based subsector. The food and confectionery group provides the largest investment. In this industry grouping, the Nigerian Sugar Company at Bacita, employs 6,000 people; Nigerian Bottling Co is next with 3,548 employees. Next to the food group comes the textile industry, where the largest employers are UNTL Kaduna Textiles, NTM and ENPEE

industries. The next industry group in terms of employment size is beer brewing and alcohol distilling. Nigerian Breweries Ltd and Guinness are leaders here with 4,539 and 2,941 employees respectively.

Table 2.6 above already provides information on the technical component of the employment in the agro-based subsector. That table also shows the expatriate components of the various categories of technical personnel. For example, there are 144 expatriate engineers, 19 consultants, 19 technologists etc in the subsector.

THE SCOPE OF MANPOWER TRAINING

All of the establishments surveyed by us claimed that they had some form of on-the-job training for all of their employees. Further enquiries reveal that in-depth training covering all aspects of the businesses, is undertaken by very few of the respondents. The respondents that carried out this indepth training were usually large multinational companies who used manpower development as an avenue for advancement within their organisations. The scope of this training is generally.

- Operational and maintenance training covering
  - process training
  - factory operatives training
  - quality control
  - general equipment and machinery maintenance
- supervisory training of foremen, and other factory supervisors
- management training of varying durations and in different locations.

As usual, the manpower training did not cover any aspects of technology that is not acquired -

- detail design skills
- machinery fabrication techniques
- R & D management

(ii) EFFECTS ON R & D EFFORT

It is needless to state the obvious that R & D effort in this subsector is negligible and rather restricted to a few organisations and government owned research institutions. Table 4.5 gives at a glance the R & D spending in the subsector by industry groupings. For the establishments for which data exist, it can be seen that indigenous R & D is very small indeed. The interesting question is why?

It has been shown earlier on that this is due to a combination of reasons namely:

(i) The nature of the predominant technologies acquired in the subsector makes R & D superfluous. The technologies are either completely mature and soneed little research or development effort for success; or they include only the operative elements that require very minimal human initiative.

(ii) The most dominant products in the subsector are internationally traded goods which are based on imported tastes. If the dominant products were based on Nigeria's staple foods such as gari,

yam, cowpeas, guinea corn and millet, it is quite possible that R & D would have been more sizeable in the general attempt to solve pressing problems.

(iii) R and D expenditure is an investment. If manufacturers in the subsector are reluctant to invest in R and D then it indicates one or all of several situations -

- that the returns to R and D are not worth the effort;
- that there are no avenues for worthwhile R and D investment
- that other forms of investment are much more attractive than R and D investments.

(iv) Economies or industries where R & D expenditure is traditionally high are characterized by a dominant risk underwriter in the form of Government or some client who needs to use the results of the research effort and therefore bears the bulk of the cost of the research. A clear support for this is the fact that the innovations that have been important in the subsector are those developed in Government research institutions which are not guided by the profit motive.

Accordingly, we find very few exceptions to the low R and D effort. The exceptions being:-

ENTITY	R AND D ACTIVITY
Nigerian Breweries Ltd	Growing barley locally for malt.
North Breweries Ltd	Development of malt from Sorghum
Cadbury's Nig Ltd	R and D on local raw materials for baby foods
Nigerian Tobacco Co.	High grade tobacco leaf development
Lever Brothers Ltd	Palm produce research and development as the largest user of palm oil.

It should be noted that, without exception all of these establishments faced serious raw material import constraints before the R and D effort was considered. It would seem therefore that import bottlenecks lead to positive R and D spending in the Nigerian case.

IV. EXTENT OF IMPORT DEPENDENCY.

The theory is that agro-based manufacturing is also based on local raw materials. The evidence available from this research shows that the sector is as dependent on imports as any other industrial subsector. Table 4.6 below shows the raw materails utilized by the respondents in this subsector. The obvious patterns that can be seen from that table are

(1) the dominant manufacturing activities in the agro-based area are based almost entirely on raw material import

- soft drinks and concentrates
- beer brewers and barley imports
- flour millers and what imports.

There are a number of other areas where over half of the raw materials requirements of the factories are imported. These areas include vegetable oil seeds (Soya beans, Sunflower, and groundnuts) textile yarn long fibre cotton; sugar meat and dairy products. Different categories of industrial chemicals used in the subsector are imported.

But perhaps the most important factor responsible for import dependency in this sector as well as any other industrial sector is the continued importation of machinery, equipemnt , spare-parts, jigs and fixtures and other artifacts of production. Import dependency in this area seems parmanent in the sense that over the years there is no trend towards the development of an indigenous capital goods manufacturing sector.

Import dependency resulting from raw materials and other variable cost items are given in Table 4.7 below. The various quantities and values are shown. It should be noted that the magnitudes shown represent only about 55% of what they should be in the entire subsector. The stated figures are the ones covering respondents who were kind enough to provide the figures. Many other considered the information too secret to be given.

Within each industry group import dependency varies among the entities. The least dependent within each industrial group, especially with respect to raw materials are as follows:

- integrated farms whose manufactured products are dependent on their farms.

- the tobacco companies whose leaf comes from thousands of farmers developed by the manufacturers through extension work, seed development and distribution and guaranteed buying.
- manufacturers whose raw materials were among the dominant export crops of Nigeria - those based on cocoa, palm produce groundnuts, cotton seeds, timber, rubber, leather and paper.
- manufacturing facilities which are located in government-owned research institutions are invariably dependent on endogenously grown raw materials
  - cereal research
  - palm oil research
  - rubber research
  - dairy research
  - leather research.

V. IMPACT ON THE GROWTH OF EXPORTS

We have no record of any significant eports from this subsector. It is quite possible that the fact is due to a combination of underlying reasons.

(1) There has been an explosion in the incomes and therefore in the domestic demand for most of the products of this subsector. Even when outputs were at their optimal level, they fell short of the domestic demand. Analysis of

of each industry group in a seperate earlier study reveals the wide gap between domestic supply capacity and demand.

(2) Actual productive capacities in all of the factories surveyed were far below the rated or full capacities. Actual output varied between 25% among vegetable oil crushers and 65% among beer brewers. The typical output was 50%. This was due to raw materials shortages due to clamp down on imports, and the rather poor performance on the agricultural front. In this situtation manufacturers were able to sell all of their output internally, and the development of exports became unnecessary.

(3) Many manufacturers who contracted technology agreements had clauses that delimited their market and precluded exports. These include soft drink makers (especially the two leaders - Nigerian Bottling Company and John Holt Investment (bottlers of Pepsi); beer brewers and the tobacco manufacturers.

(4) Nigeria is in fact a high manufacturing cost country. It seems clear that many of the products will be at a disadvantage in competition with foreign counterparts with respects to prices, packaging and the almost complete absence of export incentives that could encourage manufacturers to develop export markets.

Table 4.1

DETAILS OF TECHNOLOGY AGREEMENTS

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
(1) Supply of total scientific and technological knowledge expertise and experience. Undertakes planning, supervision for purchase of raw material. Supply of project plans. Undertakes free and continuous training of Nigerians with a view of taking over their management.	Coy undertakes to make changes to the types of beer manufactured, the raw materials etc on expert advice of Brauhaase. To send Brewmaster's report to Brauhaase.	Haase-Brauerei GMBH Germany. 'BRAUHAASE'	International Breweries Ltd, Ilesha.	27.5k per hl of 250,000 HL per annum payment of salaries & other allowances to Technical experts & personnel.
(2) Licence to use Trade Mark. Provision of technical management and services.	Licence granted shall be personal and shall not grant any sub-licences. Send total sales in company of royalty. Keep proper books of account. Keep secret.	Brewex Perts Ltd England	Continental Brewery Ltd, Ijebu-Ode	4% of CBL's total sales P.A. Payment of all fees, stamp duty, other taxes payable in connection with the registration of the licence trade mark.
(3) Provide technical advice on all aspects of production. Provide information concerning development & advances in brewing	Keep GOL and its servants officers fully indemnified against all damages. Despatch samples of products to GOL.	Guinness Overseas Ltd England	Guinness (Nig) Ltd	2% of Gross profit of Guinness (Nig) Ltd. 10% of Net sales for use of trade mark. (payment in sterling).

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
knowhow and technology. Provide world markets for raw materials access to technical information. Provide facilities for training personnel, maintenance and efficiency of operation of plant machinery & equipment.	Keep all information and advice strictly confidential & secret.			
(4) Provide tech and project management expertise required for construction, installation and commission- Recruit suitable qualified & capable personnel. Available for consultation with management	To reimburse the consultants all costs and expenses directly or indirectly incurred by the consul-tants in performing their obligations	Peter Rowland Ltd England	Mopa Breweries Ltd, Mopa	£300,000 (Sterling) & £25,000
(5) Technical adviser and consultants for the efficient operation of the coy's business. Recommend when necessary appointment of technical experts. Provide systematic and regular training of local	To keep Brauhaase inform all events occuring during manufacturing. Send Brewmaster's report each month.	Haase-Braverei GMBH W/Germany	Pabod Breweries Ltd, P/Harcourt	₦10,000 27.5k per hl of 250,000 Hl P.A.

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
Provide manufacturing formula. Advice on feasibility and profitability of future expansion of plant at no cost. Advice on general maintenance, lubrication & overhaul programme.	Cannot make changes with the advice of Brauhaase			
(6) Prepare Feasibility report. Supply of project manager to ensure compliance. Supply of training scheme. Prepare general lay-out, sketches, sketches, schemes. Supply detailed manuals, raw materials and intermediate products. Recruit & train technical staff in Scotland. Provide on the job training for all Nigerian personnel.	To obtain the necessary tax clearance certificates.	Steenland Ltd London	King Breweries & Food products Ltd, Lagos.	1½% of net sales total turnover. Payment of any taxes due in the fees of Steenland in Nigeria.
(7) Provide all technological knowledge, expertise and experience.				

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
Arrange for technical staff to visit exhibitions and seminars on brewing technology. Send technical representatives to GGBL to report on equipment. Stock of spares, and to schedule servicing. Monitor training of Nigeria technicians.	Provide accomodation, free medical, transport and necessary information.	Coutinho-Caro & Co W/Germany	Golden Guinea Breweries Ltd	20 kobo per hl of sales. ₦30,000 P.A.
(8) Evaluation of infrastructure requirement, finalizing technical and commercial negotiations. Co-ordination of final design detailed engineering, supervision of site of all pre-investment related activities covering elaboration of conceptional design, basic engineering selection of process technology.	Assist consultant in obtaining any statutory approval. approval. Supply necessary information, data and reports. Provision of a liason officer. Provision of accommodation, transportation, office facilities and free medical care.	Austrian Engineering Co. Ltd Vienna, Austria.	Bendel Brewery, Benin-City.	₦742.850 ₦5096) Service 6521) Charges Travel Costs & Lodging.

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
(9) Provide industrial formulae and know-how for the production of beer. Advise board on appointment. Supply technical staff or experts. Carry out regular quality control. Arrange and monitor both local and overseas training programmes.	Inform EL Aguila about all technical and production events. Make available copies of Brewmaster's report. Send samples of products. Payments of all salaries, travelling and accommodation expenses.	El-Aguila S.A. Spain	Standard Breweries Ltd, Apapa.	25kobo per HL of sales. ₦150,000 P.A.
(10) Prepare feasibility report, management structure of the plant. Submit flow sheets on methods of production. Supply of yeast specially selected for production. Selection and recruiting of technical management.	Apply for the necessary tax clearance of technical experts.	Cerekem, Danish, Food technologists Ltd, Denmark	Gongola Breweries Ltd, Yola.	2% of annual net profits before tax. 2.5 kobo per carton payable the 15th of each month.
(11) Small-scale production of barley. Assist and advise to train, organise and manage Nigerian project extension staff. Provision of financial and accountancy assistance and advice on important matters. Advice on development, availability of raw materials. Personnel advice on Overseas recruitment, setting up in Nigeria of training facilities and courses	Consult no other technical adviser than HTB. Make and keep available Nigerian technical personnel qualified in the brewing and production of the products. Permit HTB to inspect NBL's plant, equipment, production.	Euroconsult BV Netherlands & UAC International Ltd (UACI)	Nigerian Breweries Ltd, Lagos.	Payment of all travelling & subsistence expenses. 814,200 DF (Dutch Florins) 290 of Gross Profit

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
(12) Supply of machinery & Equipment. Guarantee of Machinery & Equipment. Replacement of spare parts used during installation C/F at no cost. Liable to company in damages in the event of delay of shipment of the machinery & equipment. Engineering services for the installation, commissioning and the operations of the M & E.	Coy to obtain process from the relevant authorities in Nigeria all necessary permits and approvals required for the execution of the plant. Assist the supplier to obtain from time to time permits to bring into Nigeria the number of its personnel required for the installation and commissioning of the machinery and equipment.	Hova-Hol Ang GMBH W/Germany	Peacock Modern Interiors Ltd	Lumpsum payment of ₦[illegible],000
(13) To secure technical know-how in planning, building and operating a modern tannery which produce finished leather of the finest quality. Supply information and Data centres regarding correct chemical formular for the production of finest sheep and goat leather.	Pay all expenses for employees, staff & workers to and from Europe. Not to disclose to any third party the information, plans, drawings & other datas. Produce sheep and goat leather. Manage the Tannery.	Nabegu Coy Nig. Ltd, Kano	Colomer Leather Int. Promotion S.A. Spain	₦5,300,000 ₦860,000 + Air Ticket to Spain

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
(14) Co-operation in establishing crop production within the frame-work of the contract. To produce corn/maize at the initial stage on agric area of 1000 hectars.	Provision of land assigned suitable for producing corn by the technology.	Rema Agric Production Ltd	Interco-Operation Coy Ltd, Hungary.	₦26730 Expert Salaries Inc. ₦95370
(15) Technical consultancy. To purchase and assemble all machinery parts required. Testing and true runs of all assembled machinery in Germany before shipment.	To obtain necessary Insurance Certificate, permits and all necessary documents. To obtain necessary permits for the entry working facilities. Provide necessary drawings. Provide necessary information and data to enable him perform his obligations. Provide suitable accommodation.	Farmex Ltd	E. Merck W/Germany	₦335,000.00
(16) Shoemaker shall take all reasonable action within their skill and experience to ensure that the products of Owena will be marketed and sold in the best way.	Owena will support Shoemaker by conducting and defending legal and arbitrary proceedings.	Owena Mills Ltd	Jan Shoemaker BV, Netherlands	1.5% of sales turnover. 4% of profit AT + USS 50,000

Items of Tech transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
	Give all possible assistance in connection with the obtaining of all necessary exchange control	Owena Mills Ltd	Jan Shoemaker BV, Netherlands.	1.5% of sales turnover. 4% of profit AT + USS 50,000
(17) Know-how and technical knowledge concerning manufacture of various brands of biscuits and formulae or recipes and machinery for the production of such biscuits. Use of trade mark 'Oxford' Use of trade mark "Dandy" "Rex" & "Stimorol". Advice to Licensee as regards machinery & equipment. Payment of yearly visit. Appointment of auditor.	Imported of all other brands of Oxford Biscuits which are not manufactured by Niger Biscuits. Payment for training. Responsible for purchase of raw materials such as gumbase, Glucose etc. To treat information strictly.	Niger Biscuit Coy Ltd, Apapa	Oxford Biscuit Factory Ltd, Denmark & Dansk Tyggegummi Fabrik A/S Denmark	Royalty of 1% sales value per annum. Sales of other brands of oxford not in production in Nigeria 1¼% 2½% of net turnover of the Licensed payment in Swiss Francs, or English equivalent.

Items of Tech. Transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
(18) Advise the Board in establishing, maintaining and supervising the Company's management Analyse and make a comparative report to the Company Technical partner for the commissioning of the wheat flour mill. Make available suitable expatriate personnel supply of wheat of appropriate qualities either through itself or through a subsidiary Company. Make available specialised plant, machinery equipments tools and spare parts reguired for the effective development and efficient conduct of the Company's business.	Exercise its best efforts to facilitate Somdiaa's assignment Make suitable premises available to Somdiaa. Obtain all necessary permits or authorisations or both, import-licences, entry visa etc. Pay all import duties & taxes clearance of Machinery from the ports.	Standard Flour Mills Ltd	A Society de Management et de development des Ind. Alimentaires French Republic	Limpsum ₦300,000 3% of profit before tax
(19) Supervision of technical and operating services and departments of the Company. Advice the Company from time to time and as and when required as to the selection appointment & dismissal	Responsible for transportations tax clearance etc	Nigerian	Textilconsult S.A	Sw.Froz.2,000 000 5% of net profit of the Company per year.

Items of Tech. Transferred	Responsibility of the Company	Transferor	Transferee	Cost of Technology
Make available to the Company all necessary technical, commercial & management skills. To act as a purchasing agent and expeditor of the Company's requirement. To advice upon all aspects of any possible expansion mill.				
(20) Supply plants & machinery		Star Paper Mill Ltd	Herlitz Consult GMBH W/Germany	₦3 million
(21) Advice NBL in all problems relating to quality control, production packaging and storage products Formulate and provide the specification of the products which N.B.L will produce and pack. Render advice in respect of the purchase, proper storage and use of raw materials give NBL all necessary information and advice relating to their sources of	N.B.L shall make available at its production facilities technical personnel qualified in the brewing & production of the products Consult no other technical adviser than HTB. permit HTB to inspect NBL's plant equipment, production facilities & stores.	Nigerian Breweries	Heineken Technisch Beheer B.V	2% of N.B.L's gross profit Du Fls 1,000,000

	Items of Tech. Transferred	Responsibility of the Company	Transferror	Transferee	Cost of Technology
(22)	The techniques involved in the technical preparations of chocolate; operatings of the plant and machinery to achieve different grades of chocolates.		Industrias De Chocolate lacta S.A.	Cocoa Industries Ltd	
(23)	Use of Trade Mark provide the Company with comprehensive technical services Training of personnel in Switzerland	To observe the standards of quality laid down, permit the proprietor to inspect goods stored, manufactured and packed To inform Proprietor of any infringements or suspected infringements of the trade mark coming to its notice. To recognise the Proprietor's title to the trade mark	Wander Ltd of Station Road Kings Langley	Ovaltine W/Af. Ltd	2½% of Net revenue on sales per annum

	Items of Tech. Transferred	Responsibility of the Comapny	Tranferror	Transferee	Cost of Technology
(24)	Provide Technical management and manpower development		Seagems Ltd	Hendon Ind Inc	₦2,500,000
(25)	Use of Trade mark	Sona must be utilise the trade mark for any other purpose	Sona Breweries Ltd	Brasseries Kronenbourg	₦212,000 ₦28,000
(26)	Supply of Machinery & Equipment and Technical expertise Supply of temporary specialised staff, Beer Brewing managerial know - how brewing, technological expertise etc	Instalment paid in 10 equal successive semi annual basis	Techno export foreign Trade Company Ltd Praha 1, Czechoslovakia	Umazon Breweries Ltd	Total remittances (including royalties lumpsom payment Us 22,105,000.00
(27)	Responsible for the know, how, Technical and management services manpower and training of personnel To operate the technical and management operations of the factory under policies. Discharge its obligations under this agreement in a diligent and business like fashion. Not to disclose to any person or persons	Make available during agreement such acts, matters, instruments and things that may be requisite and necessary for the carrying into effect of this agreement	P.H Management Consultants Ltd Jersey.	Blanket Manf. Co. Nig. Ltd	Royalty fee at the rate of 2% of total annual sales 3% Gross profit of the Company per annum

period of agreement and after its termination	Indemnity and keep indemnified the consultants from and against all liabilities actions, clairing and demand arising under or in connection with the agreement.			
(28) Supply of samples or specimens of all cigarette paper labels wrappers. Supply all necessary information formulae and recipes of preparation to enable the NTC to manufacture the said brands in accordance with the agreement.	Supply of necessary information To manufacture, sell and distribute in the said territory Goods manufactured may be exported for sale outside the territory provided the express prior written consent is obtain .	Benson & Hedges (overseas) Ltd	Nigerian Tobacco Company Ltd	
(29) Provision of operational activities. i.e office management, day to day financial and cost accounting and control, purchase of raw materials, equipment and other items.	Payment for training personnel in Nigeria and abroad to include full board and lodging, transport within Denmark, working clothes and pocket money. Payment of school fees suitable air-conditioned car.	Danish Turnkey Dairies Ltd	NECI Danish Dairy Co. Ltd	S.Fr 400,000 per year. Annual Salarie: G/M ₦30,000 Factory/M ₦25,000 Chief Eng.₦22,000

Items of Tech. Transferred	Responsibilities of the Company	Transferor	Transferee	Cost of Technology
Supply of technical information and process know-how.				
To assign employed personnel to Neci Denish Dairy Company Ltd	To designate the chairman.			Annual Managemen
To arrange necessary training of local personnel in Nigeria and abroad.	Provision of full insurance coverage against the above mentioned risks & shall hold DTD harmless against any and all claims arising from such occurance.			fee = 2% of NDD c's annual net profit before taxes
(30) Exhisit the highest skill & expertise in its effort to achieve the highest standards of production	Make and execute all such acts, matters, instruments and things that	P.H. Management Consultants Ltd Jersey, Channel Islands	Spintex Mills (Nig) Ltd	Annual Royalty fees ½ of 1% of total annual sales turnover.
To manage the factory, and have the right to utilise all buildings, plant, machinery vehicles & other equipment for the purpose of the business.	may be requisite and necessary for the carrying into effect of this agreement			2½% of G/profit of the company per annum (technical & management services)
Generally act as advisor to the Company.	To indemify and keep indemnified the consultant from and against			
To provide all manufacturing processing formulas				

	Items of Tech. Transferred	Responsibilities of the Company	Transferor	Transferee	Cost of Technology
	and other relevant information and recommend any adjustments or variations to achieve the maximum output. To set up and implement such production and quality control scheme concerning quantities and qualities of production establish standards and control charts.	all labilities actions, claims & demand arising under or in connection with this agreement.			
(31)	Supply Company with the machinery & equipment at C&F Port-Harcourt and provide the Company with specifications of the machinery & equipment. Responsible for the fulfilment of deliveries in the scope of design and quality stated. Replacement of any spare parts supplied but used during installation at no cost. Liable in damage suffered in the event of delay of shipment. Install & commission the machinery and equipment supplied provide complete operation, maintenance written in English.	The Company obtains all necessary permits and approvals required for the machinery and equipments. Obtain permits from time to time to allow Guinne to bring into Nigeria the number of its personnel requirement for the installation & commissioning of the machinery and equipment. Keep information secret. Responsible for the cost of transportation of the Engineers to and from Germany.	Guinne Webma Schineniabrik G M B H & Co.KG West Germany	Nibeltex Ind. (Nig). Ltd	5% of the total C & F value. Contract price for Machinery & Equipment 10% down payment 80% paid pro rate on shipment 10% paid 12 months after succesful commissioning. Payment for freight

Items of Tech. Transferred	Responsibilities of	Transferor	Transferee	Cost of Technology
Training programme for at least 2 Nigerians Engineers in Germany.	Responsible for marine insurance & land transportation.			Payment of custom duty payable in respect of the machinery & equipment. Payment of all taxes and fees required to be paid in respect of the site under the law.
(32) Provision of technical assistance and advice relating to the blending operations, processing & packing of the products to internationally accepted standards. Provision of facilities for the instruction and training of personnel employed by Lipton of Nig. and accepted by Lipton in the correct use of plant and equipment. Supply specialised technical advice to assist in the improvement and modification of existing plant & equipment Advice concerning the design and fabrication of packing of the products.	Send to Lipton statement giving details of Lonis profit before tax.	Lipton Nigeria Ltd	Lipton of Nigeria Ltd	Technical assistance fee of 2% of the profit of Lon before tax Payment of salaries, accommodation & travelling expenses incurred by its employees travelling out side Nigeria.

	Items of Tech. Transfered	Responsibilities of the Company.	Transferor	Transferee	Cost of Technology
	The results of R & D in respect of the products carried on by Lipton or its parent can be applied in Nigeria.				
(33)	Supervision and superintending of the technical management of the Company i.e Planning and organisation of the Company's activities within the operating budget Purchasing of raw materials such as maize, soyabeans and other ingredents. Formulation of the best concentrates premixes & feeds using local materials. Training of Nigerians nominated by the company to take over from the Brazilians. Organisation and running of a slaughter house & refrigeration cold storage including packaging. Responsible for the recruitment of Brazilian expert with good working knowledge of English Language.	The Company shall not have any similar contract with any other firm or technician other than Agrovic in Brazil. The Company shall pay the experts during their stay in the territory and under the employment of the Company salaries & other fringe benefits. Make all necessary arrangement with the Nigerian Immigration and other authorities to enable the experts accomplish their obligations.	Grandja Agrovic Limited Brazil	Ubanibras Farms Ltd	Management fee of 2% yearly gross profit or net $48,600.00 (per annum) whichever is higher.

TABLE 4.2

COSTS OF TECHNOLOGY

Firm	Patent Fees	Royalties	Lumpsum	Fixed Licence	Others	Total
(1) Nigerian Breweries Ltd		₦2,278,851	₦3,826,096			5,104,947
(2) Superbru Ltd, Agbara			₦2.03M			₦2.03M
(3) Amalgamated Distilleries P/Harcourt			₦50,000			₦50000
(4) IBBI Ltd Kaduna		₦300,000				₦300,000
(5) Guinness Nig. Ltd Ikeja		₦1,570,000		₦979,000		2,549,000
(6) Okada Dry Ltd Benin-City			₦60,000			₦60,000
(7) Bauchi Bottling Co.			₦60,000			₦60,000
(8) Nig Soft Drink Co. Ltd, Ikeja		₦174,280				₦174,280
(9) Calabar Veneer & Plywood Ltd		₦15,000		₦1,965		₦16,965
(10) Adamu Farms Ltd Auchi			₦40,000			₦40,000
(11) Ovaltine (W/A) Ltd Ikeja		₦459375				₦459,375
(12) Lipton (Nig) Ltd Apapa		₦850000				₦850,000
(13) Nig Assoc. Best Food Ltd, Jos			₦7216			₦7216
(14) Yassin Conf. Co. Ltd Kano			₦3,071,450			₦3071,450

COST OF TECHNOLOGY CONTD

Firm	Patent Fees	Royalties	Lumpsum	Fixed Licence	Others	Total
(15) Hi-quality Bakery Calabar	₦100		₦285	₦500		₦885
(16) Ile-Oluji Cocoa Produce Ltd			₦5,988,090			₦5,988,090
(17) Niger Biscuits Co. Apapa			₦350,000	2½ of net turnover for use of 'dandy'	1% sales value per annum	₦350,000
(18) Uzoma Rice Mill Abakaliki	₦60					₦60
(19) Grain Processing Azare			3% Profit AT			
(20) D.O. Akabike Mills Njukoka				₦500		₦500
(21) Adarice Production Project	₦200	₦500		₦1000		₦1,700
(22) Fadile Feeds Kabba			₦30,000			₦30,000
(23) Eto Agric Ltd, Okoro				₦6000		₦6,000
(24) Odu'a Textiles Ltd, Ado-Ekiti	₦23920		₦5442,730			₦5,466,650
(25) Enpee Ind(Nig) Ltd Lagos			₦994,000			₦994,000
(26) Kano Textile Printers		₦3500		₦200		₦3,700
(27) Spintex Mills Apapa		₦43,600	2½% of Gross Profit			₦43,600
(28) Kaduna Textile, Kaduna			₦2,800			₦2,800
(29) Nigeria Textile Mills Lagos			SW Frs 2,000,000		5% of net profit per annum	

COST OF TECHNOLOGY CONTD

Firm	Patent Fees	Royalties	Lumpsum	Fixed Licence	Others	Total
(30) International Breweries Ltd					27.5k per HL of 250,000 HL	
(31) Pabod Breweries Ltd, Port Harcourt				₦10,000	27.5k per HL of 250,000 HL	
(32) Continental Breweries Ltd, Ijebu Ode					4% of total sales payment of cost of trade mark	
(33) King Breweries & Food Products Ltd, Lagos					1½% of Net Sales	
(34) Golden Guinea Breweries Ltd, Imo State					20k per HL ₦30,000 P.A.	
(35) Bendel Breweries Ltd Benin					₦742,850 ₦111,617	
(36) Standard Breweries Ltd				₦150,000	25k per HL of 250,000 HL	
(37) Sona Breweries Ltd, Iganmu Lagos					₦847,000 (1983)	
(38) Mopa Breweries Ltd Mopa	£300,000 £25,000 P.A.				2.5k per carton payable each month	
(39) Gongola Breweries Ltd (not in production)					2% of net profit BT	

COST OF TECHNOLOGY CONTD

Firm	Patent Fees	Royalties	Lumpsum	Fixed Licence	Others	Total
(40) Seagems Ltd	£2,500,000					
(41) Rema Agricultural Production Ltd, Kaduna	£50 U.S. per month to ₦50,000				₦4,500 US per month up to ₦144,500	
(42) Nigerian Ropes Ltd	₦20,000 to ₦25,000 P.A.					
(43) Nibeltex Industries Ltd			₦1,554M			
(44) Nigerian Tobacco Co. Ltd, Lagos	2.5% of turnover					
(45) Farmex Ltd	DM 1,155M					
(46) Standard Flour Mills					₦300,000 3% of PBT	
(47) Nabegu Company Nig. Ltd			5,300,000		860,000	
(48) Peacock Modern Interiors Ltd						
(49) Owena Mills Ltd, Akure			US 50,000		4% of PAT 1.5% Sales turnover	
(50) Star Paper Mills Ltd			₦3M			
(51) Unazon Breweries Ltd, Owerri			US 22,105,000			
(52) West Africa Milk Co. Ltd			₦2,108,637			

Table 4.3

Industrial Subsector	Expenditure on R & D	Cost of Imports	Cost of Technology
	₦	₦	
Food Manufacturing	1,038521.50	258,004	13,279,053
Beverage	383,300	40,017	41,292,775
Textile	151,866		560,514,853.8
Paper & Paper Products	20,933.08		₦ 3m
Leather			
Rubber		3,811	
Furniture	38,500		16,965
Tobacco		2,606	

Notes:

1. R & D expenditure is taken for the year 1983
2. Cost of Technology represent only direct physical cash payment.
3. Cost of import is taken for the year 1979

Source: New Decade Consultants, 1984

Table 4.4

Employment impact of Agro-based manufacturing

Industry	Total Employed	Total high level personnel	% on Total
Food Confectionery/ Beverages	14,532	785	5.4%
Textiles	15,634	446	2.85%
Soft drinks Bottling	6,222	254	4.08%
Oil Seed Crushing	1,757	180	10.2%
Others	5,510	729	13.23%
Beer Brewing	8,518	1,276	14.9%
Flour & Rice Milling	929	89	9.58%

Source New Decade Consultants Survey - 1984

TABLE 4.5

Research and Development Spending by Industry Group 1983

Industrial Sectors	Expenditure on R&D
Food & Confectionery	₦1,038,521.50
Beverage	383,300.00
Textile	151,866.00
Paper and paper products	20,933.08
Leather	-
Rubber	-
Furniture	38,500.00
Tobacco	-

New Decade Consultants Survey 1983-84

Table 4. 6

SUMMARY OF RAW MATERIAL USAGE BY INDUSTRY

TEXTILES

Major R. Materials	No of Firms	Grand Total Qty per Month
Cotton Yarn	12	14,625 tonnes 4,169,650 kgs 265 MT.
Dye Stuff	6	2197 tonnes 2500 kgs.
Chemicals	5	32193 tonnes

OIL SEED CRUSHING

Major R. Materials	No. of Firms	Grand Total Qty Per Month
G/Nut	4	60, 000 MT
Cotton seeds	4	22500
Soya Beans	2	9000 tonnes
Chemicals	7	1400 tonnes

FURNITURE

Major R. Materials	No. of Firms	Grand Total Qty Per Month
Plywood	15	150,000 sqm.
Glue	15	2250 bags
Velvet materials		
Nails, polish		

Paper & Paper Products

Major R. Materials	No. of Firm	Grand Total Qty Per Month
Kraff liners	8	1600
Paper Board	8	1600 tonnes

Rubber Tyres

Major R. Materials	No. of Firm	Grand Total Qty Per Month
Carbon black	5	40 tons
Rubber solution	5	25 tons
Insoluble Sulphur	5	5 tons

Flour & Rice Milling

Major R. Materials	No. Of Firms	Grand Total Qty Per Month
1. Wheat	6	83,225 tons
2. Flour Additives	6	9000 kgs
3. Rice	3	900 bags
4. Chemicals	2	200,000 kgs

Food & Confectionery

Major R. Materials	No. Of Firms	Grand Total Qty Per Month
Flour	20	18,000 tons
Sugar	37	2590 bags
Yeast	20	240 cartons
Glucose		2600 tons

Butter	20	300 cartons
Skim Milk Powder	5	2774745 kg
Essences	8	160 tons

Soft Drinks Bottling

Major R. Materials	No. of Firms	Grand Total Qty Per Month
Sugar	12	9,348.5 tons
Concentrates	11	761,615 units
Chemicals	9	10,000 kg

Beer

Major. R. Materials	No. of Firm	Grand Total Qty Per Month
Malts	4	10,813 tons
Caps	4	4800 kg
Chemicals	4	116664 litres

Livestock Feeds

Major R. Materials	No. Of Firms	Grand Total Qty Per Month
Groundnut cake	2	4000 MT
Maize	2	1400 MT
Fish meal	2	600 MT
Middling	2	4000 MT

CHAPTER FIVE

INSTITUTIONAL INFRASTRUCTURE AND POLICIES FOR STRENGTHENING TECHNOLOGICAL CAPABILITIES IN NIGERIA .

In the proposed unified outline of draft final sectoral report, it is suggested that this chapter should be devoted to closely analysing the activities, programmes and policies of the following groups of institutions.

(a) research institutes, training and information centres

(b) educational institutions (universities, colleges technical schools etc)

(c) government institutions their programmes and policies aimed at strengthening technological capacities of agro-based subsector.

(d) government institutions responsible for regulating and controlling technology transfer.

Technological development does not take place in a vaccum. Unplanned advances in technology are rare nowadays and are usually not what can get Nigeria out of her present low level of development.

A close analysis of the activities of research and other institutions as they affect agro-based manufacturing is a task that aught to constitute a seperate study because their activities, policies and programmes defy easy treatment. In order to understand the complexity of doing a thorough analysis of these institutions and their impact, it is necessary to examine four sets of issues in great detail.

(1) Agricultural development policies and programmes as they affect raw materials availabilities in the agro-based industries.

(2) The Agricultural and industrial research institutes - their activities, programmes policies and scientific achievements - as they impinge on the development of technology in agro-based manufacturing.;

(3) Educational institutions as they affect the flow of manpower into the agro-based subsector, and ensure that their scientific breakthroughs are transformed into useful technological solution to Nigerian's production problems.

(4) Government institutions responsible for regulating and controlling technology transfer since NOIP is the only one in Nigeria - an analysis of the client.

Taking the last item first, we do not consider it worth while to x-ray the client as part of our responsibility The activities of NOIP are clearly defined in the decree that sets it up. To the best of our knowledge, whatever we say about NOIP as it affects the agro-based subsector can be said about NOIP with respect to the other subsectors

covered in the current survey. We believe it is preferable for the monitors to deal with this appraisal rather than allow each consultant to repeat the substance of a decree and give opinions that apply to all sectors of industry.

Universities, Polytechnics and other technical institutions anywhere affect industrial technology through

- manpower training
- fundamental research and
- applied research.

However, it is a universal problem that educational institutions play an infrastructural role, from which industry can draw for practical applications. A graduate engineer still has to be given industry-specific training for him to become productive material, it is a universal problem to transform discoveries in University laboratories into commercialized practical technological solutions. We do not believe that any new light can be shed on Nigeria's technological backwardness by analysing the activities, programmes, policies of over 30 Universities and Polytechnics, who have not failed to turn out graduates in thousands in all disciplines most of whom walk the streets without jobs.

We identified about 19 specialized research institutions whose activities affect the technologies in the agro-allied subsector. A catalogue of their scietific breakthroughs may indicate the stock of available technologies to be commercialized by industrialists. This may be important,

but we feel that the approach suggested has little relevance for the problems identified by this research.

Technological self-reliance is the ultimate goal of NOIP. Institutional, Infrastructure and policies for strengthening technological capabilities in this sector will be better defined in terms of the crucial problems of the subsector. The problems are not those of lack of highly trained manpower, or the scarcity of scientific discoveries from which industry can draw practical solutions. The low level of R & D identified is a consequence of several other problems, not a cause of the simple technologies in use in the subsector. NOIP is a new factor in the Nigerian technological scene whose effect it is too early to measure or start pontificating about. We therefore discard this general approach and prefer to spend the rest of this chapter dealing with the problems identified which we see as the main constraints:-

(1) Raw material import dependency, and the inability to develop indigenous substitutes for internationally traded manufactured goods

(2) A high rate of horizontal spread in similar technologies without a corresponding vertical development of acquired technologies. The low rate of development of original technical solutions to a large number of indigenous problems;

(3) A high rate of capital goods import dependency.

(4) The conspicuous absence of certain critical technologies that could be critical to the eventual development of the subsector:

(i) High quality dehydration technology to cope with harvest

glut, spoilage and wide price fluctuations in perishable agricultural products

(ii) small-scale multi-purpose food processing facilities to take advantage of dispersed, varied and seasonal sources of raw materials.

1. RAW MATERIALS IMPORT DEPENDENCY.

For a clear understanding of the real issues involved here, we must recognize four categories of raw materials in use in the agro-based subsector:

(1) Basic unprocessed raw materials

- grains, seeds such as wheat maize, rice, mill millet, sorghum, cotton, soya beans, sunflower, groundnuts
- other agricultural products - wood and lumber, eggs poultry, vegetables, coffee tea, fruits, vegetables, fish, meat, dairy, leaf

(2) Primary processed raw materials - oils, fats, flours, sugar, syrup, alcohol, leather, (these derive from one raw material.)

(3) Intermediate raw materials manufactured from a combination of primary raw materials and chemicals; - concentrates, chemicals additives, flavouring agents, and others that are mineral based.

(4) Utensils and packaging - cans, bottles, foils, polythenes, paper wrappers, etc.

Perhaps the most serious type of import dependency is that relating to the first category. Table 5.1 gives some indication of Nigeria's output of these basic raw materials. It is also useful to bring into focus, Nigeria's import of all classes of raw materials as in Table 5.2, Nigeria's export of raw materials has also declined drastically in the last few years. Import dependency seems to be due to Nigeria's inability to match its growing demand with neglected supply.

To what extent have the policies and programmes of government aided in the development of raw materials for the agro-allied industries?. To answer this question we must look at the totality of these programmes and policies. There are :

(a) Subsidies covering fertilizers, machinery (tractors and implements) and the free distribution of seeds and seedlings of the improved varities via extension programmes.

(b) Soft loans from the Nigerian Agricultural and Co-operative Bank; the agricultural credit guarantee scheme funded by the central bank via the various commercial banks; agricultural loans at concessional interest rates; and the requirement that commercial banks make a certain percentage of their loans to agriculture.

(c) Funding of Research and extension for the promotion of agricultural production via:
- specialized research institutes covering cereals, cocoa, palm produce, rubber, leather, root crops, diseases and pests,
- agricultural research institutes of the various Universities;
- ad hoc funding of special research dealing with disasters and disease outbreaks.

(d) The provision of general infrastructure to agriculture through the development of river basins, agricultural development schemes in collaboration with the World Bank,

(e) provision of incentive prices through commodity boards

(f) Direct and indirect government investment in agriculture,

(g) General tariff protection through the requirement of licences for the importation of agricultural products.

All these policies and programmes affect the supply of the agro-based raw materials under review here. One thing seems clear, however, that is, the policies and programmes have been largely ineffective in improving the supply situation. Unless the supply situation is improved, it is unrealistic to expect manufacturers to spend valuable funds in developong the technology to either use local raw materials or substitute known imports by local equivalent. The first technological task is therefore to expand supply. Expansion of the supply base will neutralize the fact that the primary raw materials have many competing uses within the economy.

The ineffective agricultural policies and programmes have led to serious drains on foreign exchange as the various figures show. A host of other undesirable trends have also resulted from the shortage of raw materials. These are: (i) high levels of unemployment due to underutilization of productive capacity

(ii) high costs of production not only as a result of high raw material prices, but also because of production in fits and starts.

(iii) high rates of inflation due largely to high prices of the products in the agro-based sector.

(iv) low rate of growth of the subsector aggravating rural-urban migration, the poor rate of rural development and serious strains on urban amenities.

What policy options offer themselves in this area?. We doubth that any new approaches exist which the Federal government has not tried. In a World Bank mission report (1982) the following measures were suggested for boosting agricultural output;

(1) Higher prices for agricultural products relatives to non-agricultural prices in order to avoid or stem the decline in Nigerian agriculture, stop rural-urban migration, and impliment the infant industry argument.

(2) A rationalization of trade policies in agriculture so as to minimize the uncertainties that accompany alternation of large ad hoc importation and restriction which present an inconsistent set of incentives. The World Bank preferred a transformation into a tariff based restriction on on imports rather than quantitative restrictions.

(3) Increase in direct government investment in agriculture.

Our objections to these World Bank policy suggestions have been stated in a different forum and need not be belaboured here. It is sufficient to underscore the fact that there is hardly any policy option that the Nigerian Government has not tried. What seems to be most lacking is long-term consistency.

In view of the long gestation period between investment and profit rewards in agriculture it is necessary for the Government to chart a clear cut unambiguous long term policy with respect to each major agricultural product covering:

- preferred varieties
- pricing
- incentive schemes
- protection against foreign competition
- guaranteed buying of all output at reasonable prices,
- funding of production
- provision of product-related infrastructure.

Policies that get reversed midstream are unlikely to generate any confidence in investors to make them worthwhile. Our suggestions on policies for each major crop are presented in Chapter 6.

We do not support general increases in agricultural product prices because of the inflationary dangers. We do not support increases in direct government investment in agriculture because of the general inefficiency, high cost nature and the wasteful approaches in these investments. We would rather recommend the active support for integrated agro-based projects whereby industrialists aid the development of farmer co-operatives and other suppliers (similar to the tobacco companies, approach) in the form of

- underwriting the initial land clearance schemes
- underwriting some of the research and extension work

- giving direct incentives to research institutes to commercialize their discoveries and new products using willing private investors;
- provision of tax shelters for industrialists who develop their own sources of raw materials locally.

2. HIGH RATE OF HORIZONTAL SPREAD IN SIMILAR TECHNOLOGIES, WITHOUT A CORRESPONDING VERTICAL DEVELOPMENT OF ACQUIRED TECHNOLOGIES.

The problems we are high-lighting here are:

(a) A proliferation of similar activities all of which are set up by direct import of the elements of technology - individual breweries going abroad to bring in technical partners; just as individual prospective soft drinks bottlers go abroad to attract their own partners; These examples can be multiplied.

(b) The technologies are similar in all respects but an old recipient does not help another to set up a similar facility; nor does an old recipient develop any innovations beyond what it borrowed.

(c) A proliferation of inventions and discoveries in research institutes which do not end up as commercially viable innovations in the economy.

The proliferation of similar low technologies is a result of the uncontrolled atmosphere of technology acquisition in Nigeria. There is no policy which prevents a new investor in soft drinks from going

abroad to bring in another bottler not already in the country, even where there are over 32 different bottlers in Nigeria. No policy requires a prospective beer brewer to look to the old brewers for technical assistance.

This is probably a new area that should take the attention of NOIP. NOIP should go beyond merely examining agreements and should deal with the proliferation of similar technologies from different sources, as a method of reducing technology costs and encouraging vertical development of technology.

The almost total absence of innovation in the agro-based entities surveyed is due to the nature of the technologies and the elements that have concerned recipients. Recipients have been more interested in operating going concerns, rather than understanding the total package of technology necessary for success in any of the industries. This is because there are no risk underwriters for those who decide to investigate alternative solutions to any technical problem. It would seem necessary that Government should begin to provide certain tax and subsidy incentives that have been used in countries such as south Korea in the development of innovations.

Perhaps the most serious constraint to transfer between old recipients and prospective investors is that clauses in most agreements prevent recipients from disclosing processes or techniques to third parties. In this regard the system used in Japan for acquiring foreign technology should be investigated for adoption.

THE JAPANESE EXPERIENCE IN THE CONTROL OF TECHNOLOGY ACQUISITION.

In describing the experience of Japan within the present report, we wish to warn that several books have been written on different phases of the technological rise of Japan. Broadly, scholars have recognized two main periods, the Meiji Regime of the 19th century and Post Second World War of Japan.

What is summarized here is the second period, which most people agree represents the time when Japan entered the new age of technological transformation.

The style of acquisition of technology in Nigeria has three basic characteristics, the opposite of which conditions are found in Japan. The three Nigerian characteristics are:

(i) each entrepreneur is free to import any thtechnology he desires from wherever he wishes, unhindered. The only constraint recently imposed is that they seek NOIP approval for all forms of foreign payments for technology;

(2) Each enterpreneur selects what he wants to acquire and no authority constrains him on the content for which payments should be made.

(3) No guidelines are given for preferred technologies or technologies for which foreign payments would not be approved.

Japan represents the best example of countries where these three conditions were imposed. It is the imposition of these conditions that leads technology recipients into R & D activities that gives rise to innovation.

The specific measures taken in Japan were as follows:

(1) The Government made periodic announcements as to what types of technology were desired for the economy. For example, for example in 1950 the list was

TEXTILES

Acetateflake and fibres

other synthetic fibres

CHEMICALS

Granulation of calcium cynamide and calcuim phosphate fertilizer
Synthetic phenol
Vinyl chloride
Melamin resins
Pigments
Furnace black

PETROLEUM

Lubricant by solvent
Refining Method
Catalytic cracking and
cracked olefin gas

NONELETRICAL MACHINERY

Continuous welded pipe drawing
Continuous wire drawing
Continuous spunning machinery
Gyro-compass for marine usage
Gynamic pressure log
Welding of ship hulls

PHARMACEUTICALS

Streptomycin
Chloromycetin
Aureomycin

ELECTRICAL MACHINERY

1-50 type integrating wall-hour meters
Demand meters
Monopole type mercury rectifiers
Plastic insulated wires and cables
Frequency modulation system in radio telecommunicat
Hyperbolic marine radio navigation systems
Microwave vacuum tubes
G.T. tubes and M. T. tubes
X-ray tubes of revolving anode type.

METALS

Soaking pit, reheating furnace and annealing furnace for steel making

CERAMICS

Furnance bed materials.

The important features of this kind of guideline are:

- the government usually names the end product, but it insists on acquiring all elements of technology that go into making the product
- in some cases a choice of technology is implied, but in such cases the choice is based on certain proven advantages.

By 1959 the announced list was much shorter. It included:

Chemical products from natural gas or petroleum gas

Heat-proof alloys and steel

Highly efficient machine tool

Electronics

Jet aircraft (including engines and engine accessories.

Techniques making processes continuous more efficient or automated.

Secondly, all technology import were strictly controlled and monitored. Firms seeking such imports were required to give quantitative indications of possible benefits to the economy.

Thirdly, technologies were usually imported and then "unpackaged" and transferred to local manufacturers.

Fourthly, the Government overtly or covertly operated a system of industrial intelligence that worked on

- prototypes from other countries,
- sophisticated inported products
- processes and techniques developed or being developed in other countries
- factory visits or attachments during which whole systems were copied, analysed, adapted and renamed.

Once approval was given for any technology import, payments for it was prompt and in accordance with agreement.

The style of acquisition of foreign technology in Japan, necessarily, required a strong R & D component - to understand, reproduce, modify, adapt and improve upon imported technology. In Nigeria the pattern is completely different. It is laisses-faire and almost completely uncontrolled.

In spite of the poor R & D effort on the manufacturing front in Nigeria, intended public sector R & D seems ample. The fourth- five year Development Plan of Nigeria made the allocations (Table V) to Government-owned R & D institution:

SUMMARY OF ALLOCATIONS
SCIENCE AND TECHNOLOGY SECTOR

NO.	NAME OF INSTITUTE	ESTIMATED TOTAL COST IN N MILLION
1.	National Veterinary Research Institute	25.00
2.	National Root Crops ResearchInstitute	34.00
3.	Nigerian Stored Products Research Institute	24.80
4.	Leather Research Institute	16.00
5.	National Cereals Institute	37.00

NO	NAME OF INSTITUTE	ESTIMATED TOTAL COST IN N MILLION
6.	National Horticultural Research Institute	22.00
7.	Nigerian Institute for Oceanography and Marine Research	18.20
8.	Intitute of Agricultural Research and Training (UNIFE)	15.30
9.	Institute of Agricultural Research (ABU)	20.00
10.	Kainji Lake Research Institute	18.00
11.	Lake Chad Research Institute	25.00
12.	Forestry Research Institute of Nigeria	21.00
13.	Nigerian Institute for Trypanosomiasis Research	18.50
14.	National AnimalProduction Research Institute	31.40
15.	Agricultural Extension and Research Liaison Service (ABU)	8.00
16.	Nigerian Institute for Oil Palm Research	19.25
17.	Cocoa Research Institute of Nigeria	14.30
18.	Rubber Research Institute of Nigeraia	17.10
19.	National Technology Development Centre	20.00
20.	Project Development Institute (PRODA)	23.10
21.	Nigerian Institute for Energy Research	40.00
22.	Federal Institute of Industrial Research	16.00
23.	National INstitute For Chemicals Research	12.00
24.	Nigerian Building and Road Research INstitute	22.00
25.	National Institute for Remote SEnsing and National Resources Assessment	5.50
26.	National Institute for Medical Research	20.00
27	Federal Ministry of Science and Technology (Headquarters Projects and Scientific and TEchnological Services)	56.53
	TOTAL	599.98

If these amounts were in fact spent by the institutions listed for R & D it would give rise to about N600.0 million in R & D expenditure over the five years or N120 million per annum.

Certain basic patterns should be noted regarding these proposals:

- Pure agricultural and agro-based R & D constitutes 56% of the total.
- Pure industrial research is 23% of total planned expenditure
- Other research takes the balance of 21%.

It is needless to say that, less than 40% of plan allocations were actually spent so far, on the basis of fragmentary information available.

If we assume that all of the funds were actually spent, that would represent 6% of total plan allocation for the five years. R & D spending in the agro-based manufacturing business represents less than 2% of public sector allocation to R & D.

TECHNOLOGY DIFFSION

The fact that many processes and products have been developed in many government research institutions, but have remained commercially unexploited is a very complex problem that defies easy explanation and solution. Some of the reasons are:

(1) Many of the processes and products have not been made known to prospective investors; many of the achievements of the stored products institutes are largely unknown to the public FIIRO itself has develop several products which have been commercialize - gari, bottled palm wine, soy-ogi, and a range of others. The commercialisation on the part of the Nigerian public.

If specific incentives are worked into the activities of the researchers in these institutes, they will be more eager to commercialize than before.

(2) Many of the inventions are not considered viable avenues of investment by prospective investors, because there is no risk undertaker for the harzards that attend the various steps of further development before viable commercialization.

It is important for government to provide this risk taking function.

3. HIGH LEVEL OF CAPITAL IMPORT DEPENDENCY

High import of capital goods such as, machinery, equipment spare parts, jigs and fixtures, and other artifacts of production is a very serious problem the solution to which is not as urgent as the others discussed earlier on. It is hard for any country to achieve technological self reliance in all elements of technology. It has to be a trade-off at some stage.

What seems important is not the need to replace import of machinery by domestic sources but a control of the price of these artifacts so that current abuses are reduced. In the long run, there should be a trend towards the development of a capital goods industry. Policies for this development are discussed in greater detail in chapter 6.

Table 5.1

ESTIMATED OUTPUT OF MAJOR AGRICULTURAL CROPS IN NIGERIA

Crops	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Millet	2,835	2,391	3,794	5,554	2,550	2,893	2,579	2,386
Guinea Corn	3,794	2,298	3,125	4,738	2,920	2,950	3,286	2,409
Groundnut	1,381	1,350	878	1,946	449	459	567	801
Beans	801	408	530	1,099	858	727	408	498
Yam	9,766	6,900	6,936	7,160	8,621	6,470	6,376	5,866
Cotton	426	105	85	481	313	294	269	211
Maize	1,274	639	808	528	1,332	1,068	651	659
Cassaca (old)	4,516	2,573	2,912	3,582	2,324	1,786	1,696	1,621
Rice	279	447	487	525	515	218	411	280
Melon	63	91	182	49	205	167	142	106
Beniseed	21	4	4	1	15	14	9	18
Cocoyam	880	1,357	1,100	480	504	532	346	182

Source: Federal Office of Statistics: Rural Economic Survey Division.

Table 5.2

IMPORT OF SELECTED RAW MATERIALS INTO NIGERIA 1975 - 1979

	1976		1977		1978		1979	
	Quantity MT	Value ₦'000	Quantity MT	Value ₦'000	Quantity MT	Value ₦'000	Quantity MT	Value ₦'000
Vegetable Oil	27,743	19,080	231,300	40,334	258,804	59,864	955,272	79,317
Wheat	730,711	97,833	719,665	96,359	474,497	93,636	804,846	124,612
Barley	17	3.8	94.5	42.8	330	109	1.448	453
Malt	55.569	14,578	66,312	20,874	87.701	24,655	97,354	30,185
Maize	9,861	1,422	36,813	7,589	80,761	15,243	40,480	22,930
Flour	1,702	388	23,684	4,200	119,880	28,793	55,178	17,756
Tobacco	1,033	1,994	972	1,753	839	2,143	2,934	2,606
Bottle Beer & Other Bottle	24,745	7,623	23,773	8,485	27,065	13,429	8,437	8,526
Crude Rubber	7.5	1,406	54,800	1,942	87,700	2,354	152,900	3,811
Vegetable Oil Seed	7.3	1,958	36	115	1.4	228	508	853
Tea			3,119	3,420	7,496	10,996	4,430	4,048
Coffee			2,095	2,316	2,079	4,370	2,964	6,690
Chocolate			2,916	1,944	2,521	3,742	2,428	2,651

Federal Office of Statistics Nigeria Trade Summary.

Table 5.3

EXPORT OF NIGERIA PRODUCTS 1976 - 1979

Product	1976 Quantity	(₦000) Value	1977 Quantity	(₦000) Value	1978 Quantity	(₦000) Value	1979 Quantity	(₦000) Value
Coffee	5,920.89	5,375.77	1,990.0	4,684	18.00	30.00	1478	2,623.2
Cocoa Beans	222,967.01	218,877.46	167,521	311,191	514,224	404,287	257,113	283,343.1
" Powder	8,490	1,245.66	1,446	4,143	-	-	8,812	9,828.5
" Butter	5,978.84	14,454.7	7,745	38,540	-	-	12,301	13,694.2
Palm Kernels	271.976	27,178	185,959	32,390	97,430	18,470	64,556	13,766.9
Groundnut Oil	-	-	-	-	-	-	700.0	161.00
" Cake	23,350.28	15,025.88	-	-	-	-	9,263	2,844.4
Shea nuts	22,512	3,015.18	0.784	1.316	1,900	1,040.0	9,263	2,844.4
Raw Cotton	-	-	-	-	20,394	20,584	20,394	20,584.0
Hides & Skin	2,922	6,815.7	2,755	5,744.5	1601	4,086	357.0	1,033.2
Raw Rubber	433,523	14,421.38	217,670	10,587	302,100	12,524	503,500	18,674.0

Source: Federal Office of Statistics: Nigeria Trade Summary.

Table 5.4

PURCHASES BY COMMODITY BOARDS

	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80
Palm Kennel	296,166	307,927	268,758	230,450	302,125	278,116	282,059	175,320	239,479	230,762
Palm Oil:	25,532	31,524	20,914	13,863	24,772	6,189	9,488	3,215	-	912
Cocoo	301,868	256,603	241,290	214,394	214,461	217,493	166,378	204,419	133,436	159,509
Guinea Corn	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	30,462	13,309
Paddy Rice	n.a	n.a	n.a	n.a	n.a	n.a	n.a	522	6,007	192
Maize	n.a	n.a	n.a	n.a	n.a	n.a	n.a	634	2,083	-
Millet	n.a	n.a	n.a	n.a	n.a	n.a	n.a	-	1,775	19
Wheat	n.a	n.a	n.a	n.a	n.a	n.a	n.a	-	1,229	981
Beniseed	5,828	3,227	3,648	3,131	3,919	5,000	1,802	2,000	n.a	n.a
Coffee Arabica	n.a	n.a	n.a	n.a	n.a	-	205	159	253	103
Coffee Robusta	n.a	n.a	n.a	n.a	n.a	2,418	1,380	1,353	805	591
Coffee Uberico	n.a	n.a	n.a	n.a	n.a	366	331	100	150	32
Cotton(seed Cotton)	115,056	110,895	143,490	86,110	140,026	70,125	212,376	115,992	117,291	n.a
Groundnuts	286,948	307,142	559,047	44,039	161,927	100,050	148,200	140,000	n.a	n.a
Soya Beans	n.a	907	2,003	872	558	1,100	1,600	1,400	n.a	n.a
Rubber Steel	n.a	n.a	n.a	n.a	n.a	n.a	n.a	4,331	2,491	2,448
Rubber Crump	n.a	n.a	n.a	n.a	n.a	n.a	n.a	14,410	11,437	12,946
Rubber Crepe	n.a	n.a	n.a	n.a	n.a	n.a	n.a	8,426	6,134	6,124

Source: Nigerian Produce Marketing Company: Nigerian Palm Produce Board;
Nigerian Cocoa Board: Nigerian Grains Board and Central Bank of Nigeria.

The Nigerian Produce Marketing Company and the State Marketing Board, were disolved in 1976 and replaced with seven Commodity Boards for Palm Produce, Grains, Cocoa, Tuber, Cotton, Groundnut and Rubber.

Note: n.a means purchase figures not available - means no purchases were recorded.

Table 5.5.

IMPORT OF SELECTED RAW MATERIALS INTO NIGERIA 1975-1978 BY CATEGORY II ESTABLISHMENTS

Quantities in Metric Tonnes

Values in (₦000)

	1975	1976		1977		1978		1979	
	Qty. Metric Ton	Value	Qty.	Value	Qty	Value	Qty.	Value(₦000
Rice	45,377	20,136	413,273	154,944	370,336	174,715	567,899	152,873
Live Animals Quantities in Number	2,149,183	1,349	5,553,574	2,715	5,575,144	2,692	25,962,371	22,030
Meat and Meat Preparations	17,934	16,303	29,454	27,132	48,946	63,278	4,018	6,323
Alcohol Quantities (1000 Litre)	130,291	59,836	214,733	88,129	40,936	19,986	5,551	5,452
Leather and Leather Products	4,218	18,224	10,426	23,024	86,550	92,238	8,856	19,387
Animal Feeds	3,242	1,712	8,657	4,212	13,300	7,060	26,421	9, 343.0
Milk Cream	157,790	123,745	148,463	97,821	13,781	14,278	48,039	59,533
Sugar	209,978	78,559	363,441	125,600	476,016	173,803,	547,695	174,983,

Source: Federal Office of Statistics. Nigeria Trade Summary

Table 5.6 MAP OF NIGERIA - SHOWING AGRO - ALLIED SECTOR

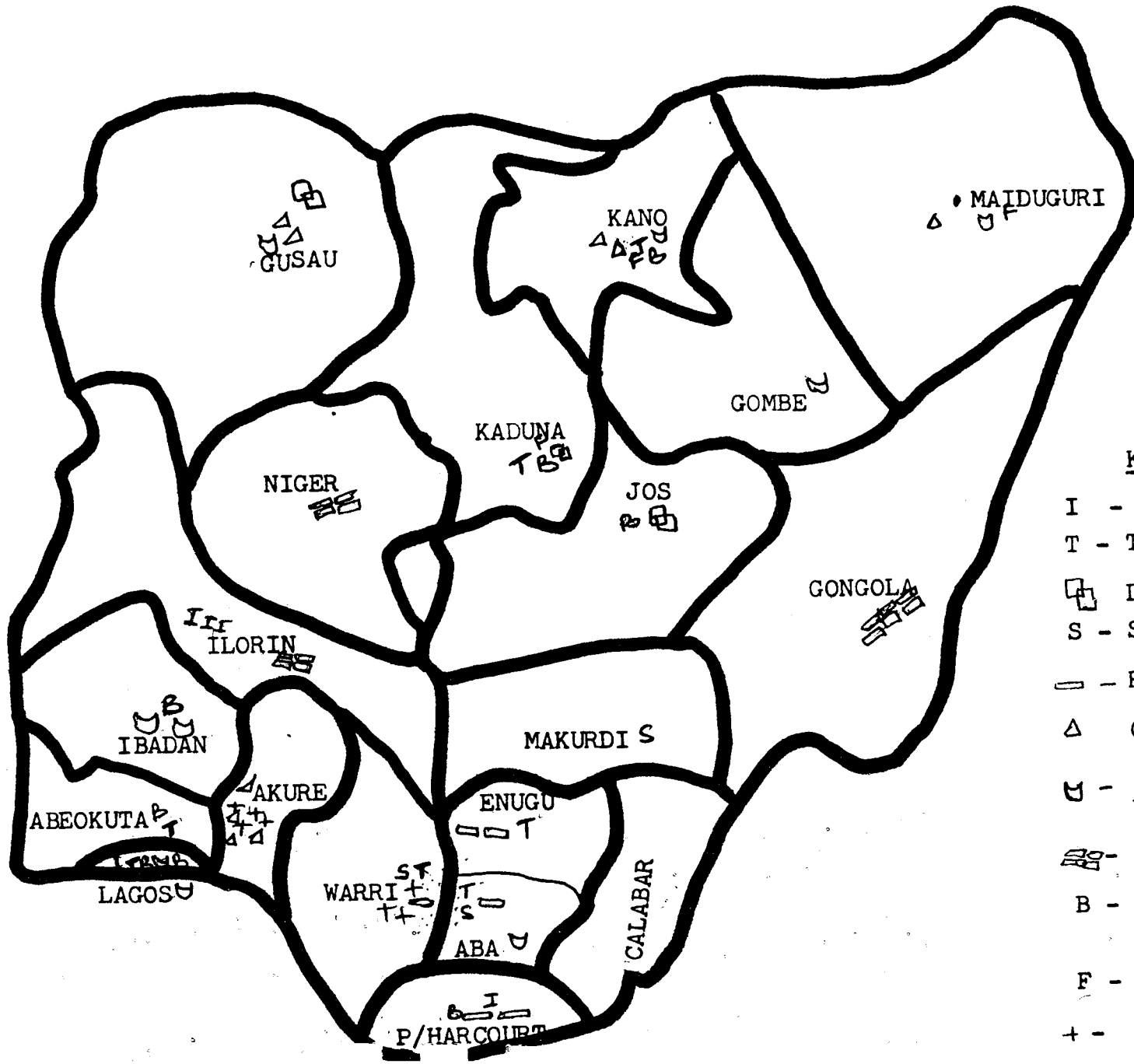

Table 5.7

SOURCES OF TECHNOLOGY BY RESPONDING ENTITY

Soft Drinks Bottling

	Name of Firm	Source of Technology (ø.6.)
1.	Union Beverages Ltd Mushin Lagos.	U. S . A
2.	Drinco Indutries Ltd Kaduna	(Brahma/Cotia) Brazil
3.	Nig. Soft Drinks Co Ltd Ikeja	(Sdiwepps Ind Ltd) U.K.
4.	Lafia Canning Factory Ibadan	U. K.
5.	Zaki Bottling Co. Ltd, Sokoto	(Ero-Plant) W/Germany
6.	Arewa Bottlers, Kaduna	W/Germany
7.	Okada Dry (Nig) Ltd BENIN	U. S. A.
8.	Union Beverages Ltd Ibadan	W. Germany & U.S.A.
9.	Bolori Bottling Co Ltd Bauchi	U. S.A
10.	Bauchi Bottling Co Ltd, Bauchi	U. K.
11.	Danta Cola Co Ltd, Kano	U. K
12.	Hilltop Bottling Co Ltd Jos.	India
13.	Okin Bottling Co. Ltd , Kaduna	Sweden
14.	Kagelu Bottling Co. Ltd Ibadan	U. S. A.
15.	Okada Bottling Plant, Kano	Europe
16.	New Food & Drinks Co. Ltd, Kaduna	W. Germany
17.	Rexonch Brewery Ltd, Enugu	W/Germany
18.	Garba Bottling Co Ltd, Kano	France (Alfa Haval Export (Erca S. A
19.	C. H. I. Ltd Ikeja	W. Germany
20.	Nigerian Bottling Co. Iddo	U. S. A, Coca cola Co.

NEW DECADE CONSULTANTS

Table 5.7 contd.

Group 2. Food & Confectionery / Beverages

	Name of Firm	Source of Technology
1.	Cocoa Industries Ltd Lagos	Holland/VIK/USA/Brazil
2.	West Africa Milk Co Ltd Ikeja	Netherlands
3.	Foods Div. of U A C Lagos.	---
4.	Foremost Dairies Ltd. Mushin	U. S. A.
5.	Midwest Rational Bakery, Benin	----
6.	Hi-quality Bakery Ltd, Calabar	Belgium
7.	Kris & Sons Ind. Ltd, Calabar	England
8.	Vegetable & Fruit Processing Ltd Gombe	Italy, U.K. U.S.A
9.	Alasiyan Bakery Ltd. Jos.	France.
10.	Champion Confectionery Co. Jos	---
11.	Nasco Foods Ltd, Jos	Italy
12.	Madara Dairy Co. Ltd. Vom	Sweden & Denmark
13.	Congo Bakery Ltd	-------
14.	Tiffany Farms Auchi	------
15.	Tropic Foods Ltd. Benin City	-----
16.	Uncle Bens Bakery, Benin	-----
17.	Tomi Tomi Special Brown Bread, Benin	---
18.	Maho Works Ltd, Benin	--
19.	Oluadi Ezowo Farms	---(Nigeria)
20.	Adamu Farms Ltd, Auchi	Belgium
21.	Ovaltine (W.A) Ltd, Ikeja	Switzerland
22.	Lipton (Nig) Ltd, Apapa	U. K.
23.	Tate & Lyle Nig Ltd Ilorin	London
24.	Yassin Confectionery Co. Ltd Kano	Italy /W/Germany
25.	Nig. Sugar Co. Ltd, Bacita	U. K.

Table 5.7 contd.

26.	Northern Bakeries Ltd, Kaduna	Britian & France
27.	Quality Foods, Ibadan	Britian/Nigeria
28.	Nig. Biscuit Manufacturing Co. Ltd Ibadan	Europe
29.	Swift Bird Sugar Co. Ltd Ibadan	Holland
30.	Kano Sugar Ind. Ltd, Kano	France
31.	Halawa Confectionery Ltd	W/Germany/Italy/Holland
32.	Bauchi Meat Factory, Bauchi	Nigeria
33.	Nigeria Dairies Co Ltd Sokoto	Sweden & Denmark
34.	Gusau Sweets Factory Gusau	W/Germany
35.	Gusau Bakery Ltd, Gusau	Sweden
36.	Nig. Associate Be,t Foods Ltd,Jos	Italy
37.	Rock Water Fish Farms Ltd, Jos	Nigeria
38.	Bagauda Biscuits Co Ltd Kano	--
39.	Moon Confectionery Ltd, Kano	Germany/U.K
40.	Five Star Bakery, Kano	England
41.	Arowosaiye Bakery Jos.	France
42.	Star Sweets Co. Ltd, Kano	W.Germany/Italy
43.	Niger Pork Products Co. Ltd,Nnewi	W/Germany
44.	Mazi Ejidikes& Sons Bakery Onitsha	England
45.	Cocoa Products Ind. Ltd. Ede	W,Germany
46.	Ile Oluji Cocoa Products C. Ltd Ile Oluji.	W Germany
47.	Kano Confectionery Ltd, Kano	Germany
48.	Candy Co (Nig) Ltd, Kano	Germany/Italy
49.	Chido Foods Ikeja	--
50.	A. C. Christlieb Nig Ltd Apapa	U. K.
51.	Niger Biscuit Co Ltd Apapa	Denmark

Table 5.7 contd.

Group 3 Beer Brewering/Distilleries

	Name of Firm	Source of Technology
1.	W. African Dist. Ltd, Ikeja	Europe
2.	Amalgamated Distilleries Ltd P/Harcourt	U.K
3.	Nig. Breweries Ltd, Lagos	Holland
4.	Superbrd Ltd Agbara - Oto	Germany
5.	Sparkling Brewery Ltd, Ughlli	--
6.	Kwara Breweries Ltd Ijagbo	W. Germany
7.	I.B.B.I. Ltd, Kaduna.	France
8.	Guinness Nig Ltd Ikeja	UK.
9.	International Breweries Ltd	W/Germany
10.	Pabod Breweries Ltd, P/Harcourt	W/Germany
11.	Continental Breweries Ltd Ijebu-Ode	U.K.
12.	King Breweries & Food Products Lagos	U. K.
13.	Golden Guinea Breweries Imo State	W/Germany
14.	Bendel Breweries Ltd Benin	Austria
15.	Standard Breweries Ltd	Spain
16.	Sona Breweries Ltd Lagos	France
17.	Gongola Breweries Ltd (not in production)	Denmark
18.	Mopa Breweries Ltd Mopa, Kwara State	U. K.
19.	Cross River Breweries Ltd	France
20.	Safari Breweries Ltd Imo State	France

Table 5.7 contd.

Group 4 Textiles

	Name of Firms	Source of Technology
1.	Atlantic Textiles Ltd, Lagos	Columbia
2.	Nig. Textile Mills Ltd	Switzerland/Italy
3.	Universal Textiles Ind Ltd, Kano	France
4.	Kaduna Textiles Ltd, Kaduna	U. K.
5.	Kano Textile Printers Ltd. Kano	India
6.	Nig. Cotton Board, Funtua	Nigeria
7.	Spintex Mills Ltd., Apapa	Channel Island
8.	United Nig. Textiles Ltd, Kaduna	Hong Kong
9.	Chinedu Textile Ltd, Abagana	U. S. A.
10.	Kay Ind. Nig. Ltd, Ikeja	Japan, Switzerland
11.	Enpee Industries Ltd, Lagos	Japan, Germany, Italy
12.	Odua Textiles Ado Ekiti	W/Germany, Poland
	Group 5. Oil Seed Crushing	
1.	Pioneer Palm Oil Nnewi	England
2.	Pioneer Oil Mill Okija,	W.Germany
3.	Vegetable Oils (Nig) Ltd, Ikeja	W. Germany
4.	Nimadco Ltd, Kano	England
5.	Seed Processing Plant, Gombe	--
6.	Kano State Oil & Allied Product Ltd Kano	France
7.	Kano Oil Millers Ltd, Kano	France
8.	Road & Fadoul Ltd, Kano	Europe, U.S.A
9.	Gombe Oil Seed Product Ltd, Gombe	England & U S A
10.	Oil Palm Co. Ltd. (Cowan Estate), Sapele	U.K.
11.	Oddy Contracts Nig. Ltd, Ibadan	--
12.	Nig Oil Mills Ltd, Kano	France
13.	Nifor Oil Mill Co Ltd, Benin	Netherlands

Table 5.7 contd.

14.	Oil Palm Co. Ltd (Wolimi) Auchi	---
15.	B. N.Okongwu & Sons Ltd, Umuahia	---
16.	Davog Oil Mills Ltd, Akure	U. S. A
Group 6.	Flour & Rice Milling	
1.	D. O. Akabike Mills Ltd, Njikoka	W. Germany
2.	P.N. Iwoka & Bros Agric. Mill Otuocha	U. S . A
3.	Adarice Production Project Ltd Adani	W. Germany
4.	Flour Mills (Nig) Ltd. Apapa	W.Germany/Switzerland
5.	Niger Mills Co Ltd, Calabar	Nigeria
6.	National Grains Product. Co. Ltd. Kaduna	Sweden
7.	Grain Processing Co. Ltd, Azare	Hungary.
8.	Nig. Eagle Flour Mills Ltd Ibadan	Germany
9.	Northern Nig. Flour Mills, Kano	Switzerland,Germany
10.	Uzoma Rice Mill, Abakaliki	Nigeria
11.	Ikwo United (Fracs) Ltd. Abakaliki	Nigeria
12.	Ideal L Flour Mills Ltd, Kaduna	Switzerland
13.	Lisabi Mills Nig Ltd, Lagos	--
Group 7 -	Others	
1.	Idemili Ind. Ltd, Nnobi - Onitsha	U. K.
2.	Umuoji Ind. Coop. Ltd, Enugu	U.K
3.	M. Nnajiofor Trading Co. Enugu	W. Germany
4.	Ugochukwu Tyres Ltd, Onitsha	W. Germany
5.	Adazi-Enu Ind. Coop. Ltd Nkwo-Adazi	Great Britain
6.	Ezechukwu Shoe Manufacturing Ltd, Onitsha	England
7.	Central State Furniture Con. Co. Enugu	W. Germany
8.	Vasity Ltd. Onitsha	W.Germany

NEWSPAPER ENCLOSURES

Table 5.7 contd.

9.	Nwoba & Co Shoe Industry, Onitsha	U.K
10.	Okoro Nwokoro Poultry Farms Ltd, Abakaliki	England
11.	Agwu & Bros, Aba	--
12.	Central Package Nig. Ltd, Ikeja	Nigeria
13.	Bendel Food Production Board Udo & Odo	--
14.	Niger Garments Manufacturing Co. Ltd Aba.	--
15.	Singlet Industry, Aba	--
16.	Katday Mod. Furniture Ltd, Bauchi	Nigeria
17.	Oyo State Paper Mill Ltd Ibadan.	Nigeria
18.	Household Prod. Ltd, Jos	Italy / W. Germany
19.	Pew Feeds Ltd, Enugu	-
20.	Megro Furniture Works, Abakaliki	-
21.	Bendel Food Production Board Auchi	
22.	Bendel Food Production Board Agbede	Germany
23.	Ajikeola Ent. Ltd (Shoe Div.) Ogbomosho	Sweden
24.	Carpet Royal Nig. Ltd	--
25.	Livestock Feeds Ltd, Ikeja	U. S. A.
26.	Abiprint & Pak Ltd, Ibadan	--
27.	Ugbabe Furniture Co. Ltd Jos	--
28.	Keystone Const. Co. Ltd, Bauchi	Nigeria
29.	Sokoto Furniture Factory, Sokoto	Italy, W/Germany
30.	Northern Sawmill Fur. Manufacturing Co Ltd, Kano	Italy, Germany
31.	United Plastic Industry Ltd P/Harcourt.	---
32.	New Nigeria Salt Co Ltd, Sapele	Britain
33.	Standard Shoe Co. Ltd, Owerri	Italy
34.	Fadile Feeds Kabba	Isreal

NEW DECADE PUBLICATIONS

Table 5.7 contd.

35.	Eto Agric Ltd, Okoro Road	U. S. A
36.	Calabar Veneer & Plywood Ltd Calabar	--
37.	Seromwood Ind. Ltd, Calabar	Romania
38.	Global Packaging & paper Ind. Ltd, Ibadan	Lebanon
39.	Gen. Plastic (Nig) Ltd, P/Harcourt	-
40.	Nasco Pack Ltd, Jos	Pakistan
41.	Offiasco Ltd	Nigeria
42.	S. G. Bonomi Ltd	England
43.	Goodell Furniture Co. Ltd, Enugu	--
44.	Kwara Paper Co. Ltd Erin-Ile	W. Germany
45.	United Match Co. Ltd Ilorin	Sweden
46.	Kwara Furniture Manufacturing Co Ltd Ilorin	--
47.	Akinbolaji & Sons S/Mill Ltd, Ondo	France
48.	Nig-Romanian Wood Industry Ltd Ondo	Romania
49.	Odutola Nig. Ind. Ltd. Ijebu Ode	Germany
50.	Adeola Farm Estate Ltd, Ijebo Ode	Nigeria
51.	Odutola Tyre & Rubber Co Ltd Ibadan	W. Germany
52.	Odutola Tyre sales Co Ltd, Ibadan	W. Germany
53.	Bordpak Premier Packaging, Apapa	--
54.	Glaxo Nig. Ltd , Apapa	U.K

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

We wish to relate our conclusions and recommendations to the four broad aims of the study at hand, namely;

(a) Stocktaking of existing Technologies

(b) Determination of the true cost of technology.

(c) Identification of need and plenty.

(d) The development of Policy.

(a) Stocktaking of Existing Technologies

The conclusions to be drawn from the stocktaking exercise in agro-based manufacturing are broadly:

(i) that the technologies available in the subsector are generally simple and acquisition has been concentrated too heavily on the operational elements to the total exclusion of those other elements that make for innovation;

(ii) that many of the entities within each industry used broadly similar technologies, but that the technologies have been acquired in a vertical manner --- every new entrant goes abroad to acquire the same technology instead of a horizontal trans far from old recipients within the country to new ones;

(iii) the main reasons for this mode of transfer seem to be -- the clauses in agreements that prohibit such transfers (where the recipient has an agreement with a technical partner); and the fact that old recipient develop very little capacity to innovate and are as dependent on external factors as the new entrants;

(iv) in terms of methodology, we can safely conclude that many issues are largely inresolved; -- definition of technological sophistication that attempts to place respondent entities on levels seems quite ambiguous and was therefore discarded; a different concept of sophistication was relied on in the agro-based study a better system has to be applied in future technology studies for obtaining certain information from firms -- costs, prices, quantities, sources, etc are treated as 'secrets' not to be disclosed;

(v) the dominant technologies in agro-based manufacturing are based on internationally traded goods which are based on foreign tastes - soft drinks bottling, beer brewing, textiles, wheat flour milling, biscuit making, feed milling; technologies based on local raw materials are constrained by irregular and insufficient availability; accordingly all pious admonition to use local resources can only succeed if the required surpluses can be generated.

(vi) the level of foreign ownership in agro-based manufacturing in Nigeria is rather low as Table 2.4 shows; this is partly due to the indigenization Decree, but probably much more due to the relative unattractiveness of agro-based manufacturing in Nigeria;

(vii) the conclusions to be drawn from sources, mechanisms of transfer, and intensity of transfer are

- a predominant number of the existing technologies come from the U.K and Western Europe generally; transfers from East European and the less developed countries are growing in number, but are still few.

- the dominant mechanism of acquiring technology in the subsector is by purchase of machinery, equipment, and other artifacts of production; transfers by use of trade marks and patent licences are next in that order; collaborative joint ownership undertakings between recipient and transferors are rather few;

- intensity of transfer as measured by the extent of the transfer activity, the involvement of the recipient in the transfer process and the nunber of elements actually transferred seems generally low.

(viii) technologies generated locally from existing manufacturers and R & D establishments within Nigeria are very few; the commercialization of local invention, new processes and products seems rather small.

(b) Determination of the True Cost of Technology

The conclusions to be drawn on the true costs of technology in Nigeria are:

(i) the biggest elements of costs in the acquisition of technology in Nigeria are not the direct payments in the form of royalties, rents, patent fees and lumpsum payments; the most dominant costs are in the form of payment for artifacts of production.

- - machinery, equipment, spare parts, jigs and fixtures, and
- raw material imports,

(ii) in terms of the direct proprietary payments the following conclusions can be drawn:-

- large differences exists in the payments agreed by different parties in respect of similar technologies; this was more prominant before the advent of NOIP.

- even the same transferor charges different recipients differently for the same technology;

- there is no regulation against payments for mere expansions or extensions to existing facilities already covered by similar payments.

(iii) hidden technology costs such as those due to transfer pricing, over invoicing etc are intractible in the Nigerian case;

(iv) efforts to control the cost of machinery spare parts and raw material costs will yield greater savings to the economy, than those directed as "splitting hairs" on payments in agreement clauses;

(c) Identification of Need and Plenty

If we deal with the areas of plenty first the following conclusions emerge.

(i) Nigeria is replete with the duplication of bottling plants, breweries, bakeries, textile plants, grain millers etc who operate on what we can call the periphery of technology; there is no depth to the technology available but the facilities get multiplied in the name of development.

(ii) the country is innundated with acquired products and processes not from the development of old recipients but from foreign transferors;

(iii) internationally traded goods predominate in the list of manufactured goods in this subsector - soft drinks, beers, tea, coffee, textiles, wheat flour, animal feeds, cornflakes, biscuits, vegetable oils, sweets, sugar, dairy etc.

The needs are conspicuous. They include:

(i) the need to go beyond peripheral operation to the acquisition of those elements of technology that yield technological capability-

- machinery and equipment design and fabrication
- detail design of manufacturing facilities
- fabrication of spare parts, in house, in an economy with very few linkage industries.

(ii) the need for R & D connected with:

(1) using local raw materials to produce widely demanded goods especially the staple goods of Nigerians.

(2) developing new products from indigenous agricultural raw materials- perboiled local rice, bread from a blend of tubers and local grains malt from sorghum etc.

(3) adapting standard machinery to solve important local problems such as peeling of cassava and other tubers in preparation for large scale processing; dehydrating local tubers for preservation and processing into flour;

(4) changing standard imported machinery to suit local conditions, tastes or needs.

(d) The Development of Policy

The conclusions to be drawn from our discussion on policy are:

(i) the starting point of any policy to transform the technological dependency of Nigeria is the achievement of self sufficiency first in Nigeria's staple foods, and then in the basic raw materials used in agro-based manufacturing; all other policies can succeed only when the twin objectives of self-sufficiency in food and basic agricultural raw materials has been achieved;

(ii) so far, the maize of policies, programmes and projects in agriculture seem to have failed to achieve these objectives; and our diagnosis is that the failure is due to long-term in consistency in the policies and programmes and the long-term relative risks in agricultural investments.

(iii) we have examined the policies relating to technological development and conclude that the constraints to technological development apart from the raw materials issue is the lack of control on the mode of transfer;

- nothing stops the simultaneous importation of the same technology from several sources by different recipients.

- nothing requires a new entrant to go to an existing local user of a technology,

(iv) with respect to research institutes and their inventions, we conclude that the public is either unaware of the processes and products invented or there does not exist any incentive to encourage the diffussion of such technologies.

Recommendations.

We recommend as follows:-

1. As a prerequisite for greater technological self-reliance, the Government - Federal and State - should seek methods of achieving self - sufficiency in staple foods so that enough surpluses can be generated for industry. Only when industrialists can count on local surpluses can they spend time and other resources to develop their activities around the agricultural base of the country. Our suggestions on this are summarized as hereunder.

(i) We urge the Governments - state and Federal - to make explicit and unambiguous their long-term policies with respect to agriculture. The prerequisite for development is a clear policy which is consistently followed and executed.

(ii) A provision of project-related subsidy scheme for agriculture which seeks to under-write investments in infrastructure for investors located in disadventaged areas. These subsidies should be enjoyed only by investors in the agro-allied sector.

(iii) Active encouragement by Government of integrated agric-industry projects whereby industrialists aid the development of farmer co-operatives and other suppliers of needed raw materials in a mode similar to that implemented by cigarette manufacturers. The support should take the form of

- underwriting the initial land clearance costs
- underwriting research and extension work by the industrialists for the prospective suppliers.
- provision of tax shelters for initial returns.

(iv) Above all a more efficient method of monitoring Government investment in the sector in order to minimized shaddy deals and the perference for giving out supply contracts on agricultural inputs.

What Government currently spends on agriculture may yeild substantially better results if better monitoring and control systems are instituted and adhered to. The second side of the coin is our opinion that the Government should make a deliberate attempt to secure self-sufficiency in the staple foods of Nigerians:

Cassava -	gari, cassava starch, fufu
Yams -	yam flour, and yam powder.
Palm Produce-	refined oil, palm oil, kernel oil,
Rice -	polished rice, ground rice
Beans -	bean - four etc.
Groundnuts -	groundnut oil, cake, meal
Sorghum -	sorghum flour
Millet -	millet flour.

Our recipe for this is not direct government involvement in direct production, but government aid in the form of acquisition of farming land for lease to prospective and proven formers; underwriting of initial land clearing investment in the form of matching grants; development of extension services for the storage and preservation of staple foods in order to reduce the current waste that occurs between harvest and actual consumption.

Unless Nigerians can feed themselves, it will be almost impossible to develop any level of self reliance in industrial raw materials because of the competition between consumer users and manufacturers for the same basic materials.

CASSAVA

The biggest issue here is the loss of crop through a malignant disease that has ravaged the crop for some years now.

YAMS

Here the problem seems to be that of spoilage. It is understood that advances have been made in the area of storage through dehyderation and treatment with chemicals. These advances have remained predominatnly as research issues with very limited application.

PALM PRODUCE

Palm produce has faced several problems. First, the wild variety which used to provide the bulk of Nigeria's output of palm oil and kernel are no longer harvested, because labour is no longer cheap and harzards of tall tree climbing have made the trade less attractive. Second, the short varieties which have been developed in plantations have not been commercialized widely enough. Third, consumer demand has outstripped supply so mcuh that the country has become a major importer of palm oil. Fourth, it has not been possible to encourage large industrial users to go into plantations because of the uncertainties surrounding such investment. To boost production in this area it will be necessary to tackle each of these problems concretely.

RICE

The biggest impediment to rice production is the fact of large importation of polished rice. Before the decision to import rice, Nigeria apparently, the most serious problems is that of producer incentive. The commercialization of the fast yielding, upland varieties would also help in the process.

Once a deliberate policy of non-importation of rice is adopted the full potential of the various river basin development authorities and the National Grain Production Company can be exploited profitably.

BEANS

For a long time the most serious problems with beans was the poor yeild and disease infestation. Some high yielding varieties of cow-peas have been developed, but heavy losses still occur after harvest due to various bugs and rodents. Storage techniques developed by the Nigerian Stored Products Institute do not seem to be widely known or applied. Also the vast potentialities for developing soya beans commercially have not been taken up seriously by the Federal Government. A detail feasibility report was commissioned and completed by us as far back as December 1981, but nothing seems to have been done on it.

GROUNDNUTS

Yields fell disastrously because of disease and pests that ravaged the groundnut growing areas of Kano, Kaduna and other parts of the States. It is claimed that the groundnut pyramids that used to be a feature of Kano are returning gradually. Stability in producer prices would to a long way to give the trend an irreversible momentum. More important, large scale growing of groundnuts should be encouraged as much as possible.

SORGHUM AND MILLET

These are staple foods in the far Northern States- Kaduna, Kano, Sokoto, Borno, Niger and Gongola. The biggest obstacle is the yield varieties developed in the Institute of Agricultural Research Samaru do not seem to have been widely adopted.

This may require major efforts in the direction of extension services in order that traditional varieties can be replaced. Also the horticultural practices applied in the growing of the two crops do seem to limit the extent of average farmer holding. "No-till" practices with emphasis on the use of herbicides and other weed control methods will substantially boost the average size of holdings and yields.

2. As a means of deepening the technological capabilities in this sector we recommend the following:

(a) NOIP should concern itself much more with dealing in total technology packages imports for dizsemination within the country. This means that technology transfer should be negotiated in broad terms with owners so that total packages are acquired from which individual local investors can obtain whatever elements interests them. This will ensure that every aspect connected with any given technology is acquired rather than allowing every individual to acquire from abroad individually.

(b) In order to encourage the deepening of existing perepheral technologies, different funds should be created for the pioneering of research and development to expand capabilities.

The funds should be to finance joint research and development or centralized facilities for the deepening of technology. Contributors to these funds should be :

(i) the industrial entities within each technology
(ii) international organisations willing to further these aims,
(iii) the Federal Government .

The funds should be closely monitored and administered by representatives of the donors. Such funds should be created for:

- soft drink bottling for the purpose of developing local concentrates
- beer brewers for the development of local malt
- flour millers for the purpose of developing bread flour from local resources
- feed millers for developing local feed concentrates.
- process fund for adaptations of machinery and equipment in the agro-based subsector.

(c) To obtain the finance for these various funds we recommended the following arrangements:

(i) All manufacturers in the industries affected should be made to pay 10% of their after tax profits to the recommended fund; alternatively, additional import duty be imposed on the imports and the proceeds passed on to fund.

(ii) the Federal Ministry responsible for science and technology should provide matching funds equal to what all manufacturers have contributed to the fund.

(iii) Utilization of the fund resources should be tied to applied research programmes of individual manufacturers or independent organisations seeking solutions to specific problems defined by the fund; existing R & D institutes could be funded to deal with these problems.

(iv) Fund membership should be drawn from the individual firms (on a rotational basis) and from representatives of the ministry in charge of science and technology.

(c) A seperate study of the inventions and innovations of all government research institutes should be commissioned. The study should give as much detail as possible of the breakthroughs, the problems that they solve and what is required for their commercialisation. This should be made available to prospective investors at a price. NOIP should then act as a kind of diffusion agent in the commercialization of these inventions.

(d) R & D should be promoted and sheltered:

- those who spend funds on R & D for genuine solutions to important problems should be given tax shelters and exceptions; and in cases considered as critical matching funds should be provided even to private investors.

Government should from time to time advertise critical technical problems to which solutions are sought and give indication as to what they would do to help those willing to deal with the problems.

(c) NOIP should start a price monitoring programme for various items of manufacturing artifacts with a view to playing a leadership role in the economy the prices would form important bench marks for analysing the investment proposals of future manufacturers.

NATIONAL OFFICE OF INDUSTRIAL PROPERTY,
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P. M. B. 12806,
LAGOS.

UNIFIED QUESTIONNAIRE FOR A COMPREHENSIVE SURVEY OF ALL EXISTING TECHNOLOGIES IN NIGERIA'S MANUFACTURING SECTOR:

CONSULTANT: .....

SECTOR: ..... NO: .....

IDENTIFICATION

ISIC				

1. Name of Company .....
2. Registered Address .....
   .....
   .....
   .....
3. Ownership Structure:

	% Equity
(a) Nigerian	.....
(i) Private	.....
(ii) Government	.....
(b) Foreign	.....

4. Actual number of employees .....

5. Was there any feasibility study conducted by you prior to the establishment of your project?

Yes ☐ No ☐

6. If yes was the consultant

Nigerian ☐ Foreign ☐

7. Who was responsible for the overall design of your factory?

Nigerian ☐

Foreigner ☐ Please state country of origin

Nigerians and Foreigners ☐

8. Was the installation and commissioning of your plant carried out chiefly by foreigners or Nigerians?

9. Please state the level of participation by Nigerians:

Up to 10%	50%
25%	75%
	100%

10. Products:- Please List

(a) .....

(b) .....

(c) .....

(d) .....

(e) .....

11. Plant Locations (Please List All)

.....

.....

.....

.....

12. Nature of Business (check applicable box(es):

Manufacturing ☐

Assembly ☐

Compounding ☐

13. Indicate percentage of parts or components produced locally

(i) 0 - 25% .....

(ii) 26 - 50% .....

(iii) 51 - 75% .....

(iv) Over 75% .....

14. Production Capacity (i) Present .....

(ii) Planned .....

(iii) Actual .....

15. Described very briefly your production process .....

.....

.....

.....

.....

.....

.....

16.

RAW MATERIALS	SOURCES			
Principal Raw Materials	Local (%)		Foreign (%)	
	%	Value	%	Value

17. What steps do you think should be taken to reduce the level of imported raw materials for your products?

18. Please give the name and source of technology in use in your company.

.....

.....

.....

19. What are the advantages of this technology over the others?

(a) Technical advantages:

.....

.....

(b) Financial advantages:

.....

.....

20. Do you have technology transfer agreements with a foreign partner or associate (including agreements presently valid)?

Yes _____

No _____

21. If yes, provide the following data:

No	NAME OF THE FOREIGN PARTNER	YEAR OF COMMENCEMENT	EXPIRY DATE

22. Please provide information on each agreement listed in paragraph 21 above. (Additional information may be provided on another copy of this page if necessary).

No: .....

What is the relationship between your company and the foreign partners?

Completely Independent	
Affiliated Company	
Contractual Joint Venture	
Subsidiary	

Please indicate the nature of the agreement.

	YES	NO
Trade Mark		
Patent		
Know-How		
Franchise		
Technical Service and/or Assistance		
Others, please specify		

What is the duration of the agreement? [ ] Years

Does the agreement provide for:

(a) Supply of basic and detailed engineering Yes [ ] No [ ]

(b) Supply of operating staff? Yes [ ] NO [ ]

(c) Supply of managerial assistance? Yes [ ] No [ ]

(d) Training of local personnel? Yes [ ] No [ ]

(e) Supply of machinery and equipment? Yes [ ] No [ ]

(f) Installation and commissioning of machinery and equipment? Yes [ ] No [ ]

(g) Supply of raw materials? Yes [ ] No [ ]

23. Are the licensed technologies licensed to other firms

(i) in the country? .....

(ii) outside the country? .....

24. Total remittances (including royalties, lumpsum payments, fixed fees, and other forms or payments) on a yearly basis for the last five years.

	Technical Fee	Management Fee	Lumpsum	Royalties	Reimbur-sable	Other (Specify)	Total (Naira)
19...							
19...							
19...							
19...							
19...							

25. If applicable indicate the royalty level (%) and the royalty base (i.e net sales, profit etc).

Export Earnings:

26. Are the products of your Company for export YES [ ] NO [ ]

27. Please indicate export sales for the past five years.

	sales in Naira	
YEAR	ECOWAS	other countries
1979		
1980		
1981		
1982		
1983		

28. Skilled Personnel Distribution

How many of the following categories of personnel were employed by your company in the past three years?

YEAR	1981		1982		1983	
Category	Nig.	Expat.	Nig.	Expat.	Nig.	Expat.
Managerial						
Technical						
Artisan						
Skilled Operations						

29. Which of the following skills is more critical for your optimum performance.

(a) Operating skills

(b) Maintenance skills

(c) Design capability.

30. Can Nigerians design the machines in your factory?

Yes ☐ No ☐

31. If no, what do you think are the constraints?

.....

.....

.....

.....

32. Can Nigerians adequately cope with the repair and maintenance of these machines?

Yes ☐ No ☐

33. Can Nigerians cope completely with the processing technology required for your products?

Yes ☐ No ☐

34. If no, please state areas of processing where foreigners are used.

Training

35. Does your company have regular training programme?

Yes ☐ No ☐

36. How many of the following categories of personnel were trained within the last five years.

CATEGORY	Number Trained	Where Trained	Duration of Training
Managerial			
Technical			
Artisan			
Skilled Operators			

Quality Control

37. Do you have a seperate Quality Control Department?

Yes _____ No _____

38. How many of your personnel are engaged in quality control?

Nigerians	
Foreigners	

39. Can Nigerians cope adequately with the quality control operations of your company in the areas of:

	YES	NO
Raw Materials Control		
Process Control		
Product Control		

40. Research and Development

40. Does your company carry out any research and development?

Yes [ ] No [ ]

41. If so in what areas: please tick as appropriate.

Process development	
Equipment design	
Raw Material replacement	

42. How much of this work is done

Locally %

Abroad %

43. If locally, to what extent are expatriates involved?

.....

.....

44. If abroad, are Nigerians being trained to do this work?

Yes [ ] No [ ]

45. If No, what are the constraints?

.....

.....

46. What is your expenditure on research and development annually in the last 5 years?

1979 .....

1980 .....

1981 .....

1982 .....

1983 .....

47. Is your company using local technology in your manufacturing process?

Yes ☐ No ☐

48. If yes, who developed it?

.....

49. How significant is the local technology in your manufacturing process?

.....

.....

.....

50. Do you have any contract with any research institute or University in Nigeria?

Yes ☐ No ☐

51. Have you found the result of their work useful?

Yes ☐ No ☐

52. Suggest ways of making the work of Nigeria research institutes and Universities more useful to the manufacturing sector of the economy.

.....

.....

.....

53. What steps would you recommend the Federal Government should take to achieve the effective adaptation of and transfer of technology in the industry.

.....

.....

.....

54. Questionnaire Completed:

By: .....

Designation: .....

Company Stamp: .....

Date: .....

Annexture 2

LIST OF COMPANIES SURVEYED

1. The Nigerian Sugar Coy Ltd, Bacita'
2. Toni Toni Special, Benin.
3. Uncle Bens Bakery, Benin City.
4. Maho Works Ltd, Benin City.
5. Midwest Rational Bakery, Benin.
6. Krisandsons Investments Ltd, Calabar.
7. Hi - Quality Bakery Ltd, Calabar.
8. Alasemsin Bakery Ltd, Jos.
9. Tate & Lyle Nig. Ltd, Ilorin.
10. Kano Sugar Ind. Ltd, Kano.
11. Swift Bird Sugar Co. (Nig.) Ltd.
12. Mazi Ejidikes & Sons Bakery.
13. Kongo Bakery Ltd, Benin.
14. Northern Bakeries (Nig.) Ltd, Kaduna.
15. West Africa Milk Coy Ltd, Ikeja.
16. Vegetable & Fruits Processing, Gombe.
17. Madara Dairy Coy Ltd, Vom - Jos.
18. Nig. Associated Best Foods Ltd, Jos.
19. Nig. Dairies Co. Ltd, Sokoto.
20. Adamu Farms Ltd, Auchi.
21. Foods Division of UAC, Lagos.
22. Foremost Dairies (Nig) Ltd, Mushin.
23. Bauchi Meat Factory.

Annexture 2 contd.

24. Gusau Bakery Ltd, Gusau.
25. Five Star Bakery, Kano.
26. Arowosaiye Bakery, Jos.
27. Niger Pork Products Co. Ltd.
28. Rock Water Fish AFarms Ltd.
29. Niger Biscuits Co. Ltd, Lagos.
30. Cocoa Industires Ltd, Ikeja.
31. Ile - Oluji Cocoa Products Co.Ltd.
32. Cocoa Products Ind. (Nig) Ltd, Ede.
33. Yassin Confs. Co. (Nig) Ltd, Kano.
34. Tropic Foods Ltd, Benin City.
35. Bagamda Biscuits Co. Ltd.
36. Moon Confs. Ltd, Shanda Kano.
37. Gusau Sweets Factory, Gusau.
38. Ovaltine (W.A.) Ltd, Ikeja.
39. Kano Confs. Ltd, Kano.
40. The Candy Coy of Nig. Ltd, Kano.
41. Star Sweets Coy Ltd, Kano.
42. Nasco Foods (Nig) Ltd, Jos.
43. Halawa Confs. (Nig) Ltd.
44. Quality Foods, Ibadan.
45. Nigerian Biscuits Mfg. Co. Ltd, Ibadan.
46. Chido Foods, Lagos.
47. A. C. Christlieb (Nig) Ltd.
48. Lipton of Nig. Ltd, Apapa.

Annexture 2 contd.

49. Champion Confectionery Co. Nig. Ltd, Jos.
50. Lafia Canning Factory, Ibadan.
51. Okoro Nwokoro Poultry Farm, Abakaliki.
52. Niger Mills Co. Ltd, Calabar.
53. Adance Production Project Ltd, Anambra State.
54. Ideal Flour Mills Ltd, Kaduna.
55. Northern Nig. Flour Mills, Kano.
56. Nig. Eagle Flour Mills Ltd, Ibadan.
57. Flour Mills of Nig. Ltd, Apapa.
58. National Grains Production Coy, Kaduna.
59. Lisabi Mills Nig. Ltd.
60. Grains Processing Co. (Nig) Ltd, Azare.
61. Ikwo United FMCS Ltd, Anambra.
62. Uzoma Rice Mill, Anambra.
63. P.M. Inoka & Bros Rice Agric, Anambra State.
64. D. O. Ababike Gari & Corn, Anambra State.
65. Fadile Feeds, Kabba.
66. Livestock Feeds Ltd, Ikeja.
67. Bendel Food Production, Sapele Road (HQ)
68. Bendel Food Production, Agbede.
69. Bendel Food Production Feedmills.
70. Reco Feeds Ltd, Enugu.
71. Ato Agric Feeds, Okoro Road.
72. Tihanny Farms, Benin City.
73. Ohiadi Ezomo Farms, Sabongida.
74. Gombe Oilseed Pro. Ltd, Gombe.

Annexture 2 contd.

237. Michemtex Ind. Ltd.

238. Western Textile Mills Ltd.

239. Kaura Biscuits & Macroni Ltd.

240. P. H. Flour Mills Ltd.

241. P. S. Mandrices Ltd.

242. Studio Press Ltd.

243. Rema Agric Prod. Ltd.

244. Wiggins Teape.

245. General Cotton Mill,

246. Bata Nigeria Ltd.

247. Eagle Flour Mills Ltd.

248. Niger Mills Ltd, Calabar.

249. Cross River Breweries.

250. International Cgarette Coy. Ltd.

251. Bittex.

252. Safari Breweries (Nig) Ltd.

253. Northern Expellers Ltd.

254. Unazon Breweries Ltd.

255. Speco Mills.

256. Life Flour Mills Ltd.

257. Maco Foods.

Annexture 2 contd.

75. Kanp State Oil & Allied Products, Kano.
76. Oddy Contracts Nig. Ltd, Lagos Road, Ibadan.
77. Raad & Fadoul Ltd, Kano.
78. The Kano Oil Millers Ltd, Kano.
79. Seed Processing Plant, Gombe.
80. Minadco Ltd, Kano.
81. Nig. Oil Mills Ltd, Kano.
82. Vegetable Oil (Nig) Ltd.
83. Oil Plam Co. Ltd, Erohimi.
84. Chinoh Oils, Aba.
85. Oil Palm Co. Ltd, Sapele.
86. Davog Oil Mill Ltd, Akure.
87. B. N. Okongro & Sons Ltd, Imo State.
88. Pioneer Oil Mills.
89. Mifor Oil Mill Coy Ltd, Benin-City.
90. Pioneer Palm Oil, Nnewi.
91. Bodpack Premier Packaging.
92. Nig. Paper Mill Ltd, Jebba.
93. Central Package Nig. Ltd, Ikeja.
94. Nasco Pack Ltd, Jos.
95. Global Packaging & Paper Ind. Ltd, Ibadan.
96. Abiprint & Pak Ltd,, Ibadan.
97. Oyo State Paper Mill Ltd, Ibadan.
98. Kwara Paper Converters Ltd, Erin-Ile.
99. Versite Ltd, Onitsha.
100. Ajikeola Ent. Ltd, Ogbomosho.

Annexture 2 contd.

101. Idemili Industries Ltd, Onitsha.
102. Ezechukwu Shoe Mfg. Ltd, Onitsha.
103. Nwoba & Co Shoe Industry, Onitsha.
104. Standard Shoe Co. Ltd, Owerri.
105. Odutola Tyre & Rubber Co. Ltd, Ibadan.
106. Odutola Nig. Ind. Ltd, Ijebu-Ode.
107. Adeola Farms & States Ltd, Ijebu-Ode.
108. Ugochukwu Tyres Ltd, Onitsha.
109. Michelin (Nig.) Ltd, P/H.
110. Pamol (Nig) Ltd, Calabar.
111. Nigerian Cotton Board, Funtua.
112. Kaduna Textile Ltd, Kaduna.
113. Atlantic Textile Manu. Co. Ltd, Lagos.
114. Chinedu Textile Industry, Abagana.
115. Spintex Mills Nig. Ltd, Lagos.
116. Kano Textile Printers Ltd, Kano.
117. Universal Textiles Ind. Ltd, Kano.
118. Kay Industries Nig. Ltd, Ikeja.
119. Enpee Industries Nig. Ltd.
120. Nig. Textile Mills Ltd, Ikeja.
121. Odu'a Textile Ltd, Ado Ekiti.
122. Offiasco Ltd, Aba.
123. Carpet Royal Nig. Ltd, Ibadan.
124. Singlet Industry, Aba.
125. Agwu & Brothers, Aba.
126. Adazi-Enu Ind. Coop. Ltd, Adazi-Enu.
127. Umuoji Ind. Coop Ltd, Onitsha.
128. Niger Garments Mfg Co.

Annexture 2 contd.

129. United Nig. Textiles Ltd, Kaduna.
130. Kwara Furniture Mac Co. Ltd.
131. Negro Furniture Works.
132. Northern Sawmill Furniture.
133. Keystone Const. Co. Ltd.
134. Sokoto Furniture Factory.
135. Ugbabe Furniture Co. Ltd.
136. Calabar Veneer & Plywood Ltd.
137. Nig. Romanican Wood Ind. Ltd.
138. Michael Nnajiafor Trading.
139. Central State Workshop.
140. Goodell Furniture Ltd.
141. S.C. Bonomi Ltd.
142. Seromwood Ind. Ltd.
143. Akinbdaji & Sons Mills Ltd.
144. Union Beverage Ltd, Lagos.
145. Drinco Industries Ltd, Kaduna.
146. Nigerian Breweries Ltd.
147. International Beer & Beverage Ind, IBBI Kaduna.
148. Bolori Bottling Co. Ltd.
149. Nigerian Soft Drinks Co. Ltd.
150. Rexonoh Brewery Ltd.
151. Zaki Bottling Co. Nig. Ltd.
152. Lagelu Bottling Co. Nig., Ibadan,
153. Hillop Bottling Co. Ltd, Jos.
154. Bauchi Bottling Co. Ltd, Bauchi.
155. Arewa Bottlers, Kaduna.
156. Okin Bottling Co. Ltd.

Annexture 2 contd.

157. New Food & Drinks Co. Ltd.

158. CHI Ltd, Lagos.

159. Garba Bottling Co. Ltd.

160. Union Bottling Ltd.

161. Danta Cola Co. Ltd.

162. Okada Bottling Plant Kano.

163. Okada Dry (Nig) Ltd.

164. Kwara Breweries Ltd.

165. Sparkling Brewery Ltd.

166. Sperbru.

167. Amalgamated Distillers Nig. Ltd.

168. West African Distillers Ltd.

169. Guinness Nig. Ltd, Ikeja.

170. Continental Breweries Ltd, Ijebu-Ode.

171. Lever Brothers Nig. Ltd, Apapa.

172. Maiduguri Flour Mill Ltd.

173. Golden Guinea Breweries Ltd.

174. Gongola Brewery Ltd.

175. Cadbury Ltd.

176. Pobad Breweries Ltd.

177. King Breweries and Food Products.

178. Standard Breweries (Nig) Ltd.

179. Mopa Breweries Ltd.

180. Owena Mills Co. Ltd.

181. Ubanibras Farms Ltd.

Annexture 2 contd.

182. Nibeltex Industries (Nig) Ltd.

183. Seagem's Ltd.

184. Neci-Danish Dairy Comp. (Nig) Ltd.

185. Standard Flour Mills Ltd.

186. Nabegu Co. Nig. Ltd, Kano.

187. 7-UP Bottling Company Ijora.

188. Thomas Wyatts, Iganmu.

189. Sona Breweries Ltd.

190. Continental Breweries Ido House.

191. West African Breweries, Iponri.

192. Food Specialist, Ilupeju Industrial Estate.

193. Lever Brothers (Nig) Ltd, Apapa.

194. Philip Morris (Nig) Ltd.

195. Nig. Tobacco Coy.

196. Intra Tobacco Coy.

197. Afprint (Nig) Ltd.

198. Continental Textile.

199. Agege Dairy Farm.

200. Walis (Nig) Ltd.

201. Express Dairy.

202. Nigerian Coffee Ltd.

203. Nitocot.

204. Alalade Farm Projects Ltd.

205. Olaogun Enterprises Ltd.

206. Fablon Ltd.

207. President Clothing Company.

208. Arcee Textile Industries Ltd.

209. A. T. Bordman & Co.Ltd.

Annexure 2 contd.

210. Niger West Embroidery Coy Ltd.
211. Naja Food Ltd.
212. Niger Cafe (niger Food Ltd).
213. Christlieb (nig) Ltd.
214. L & K Fine Foods Ltd.
215. Atlantic Mercantile Coy Ltd.
216. Biscuit Manufacturing Coy.
217. Pamil Industries Ltd.
218. Katsubag Luk Mill Ltd.
219. The Wacagency Veg. Oil Co. Ltd.
220. Westex.
221. P. Z. Industry.
222. Fan Milk Ltd.
223. Mitchell Farms.
224. Crown Flour Mill Ltd.
225. Nig. Ropes Ltd.
226. Standard Breweries (Nigeria) Ltd.
227. International Breweries Ltd.
228. Kaduna Furniture & Carpets Coy. Ltd.
229. Elewa Food Processing Coy. Ltd.
230. Vegfru Farms (Inlaks).
231. Sugar Manufacturing Fac. (Inlaks).
232. Topland Foods Co. (Nig.) Ltd.
233. Five Star.
234. Benkaof Beverages Ltd.
235. Elderson (Nig) Ltd.
236. Foremost Dairies.